

## **CHAPTER 4 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS**

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This chapter describes the affected (existing) environment in the project study area and the potential effects that could occur due to the No-Build Alternative and implementation of the proposed project.

### **4.1 LAND OWNERSHIP AND JURISDICTION, AND LAND USE**

#### **4.1.1 Land Ownership and Jurisdiction**

Land within the study area consists of public and private lands (Figure 2-1) within the jurisdiction of the City of Phoenix. Publicly owned lands in the project study area consist of State Trust land managed by the ASLD. Approximately 94.3 percent of the proposed project traverses ASLD land and 3.7 percent traverses private lands. The remainder of the project would occur on land owned by the City of Phoenix.

#### **4.1.2 Land Use**

##### **Existing Conditions**

Figure 4-1 shows existing land uses including percentages of land uses traversed within the proposed project area. Vacant/undeveloped land accounts for 99.8 percent of the study area, with the remaining 0.2 percent used for utility purposes. Existing land uses within the study area were inventoried and surrounding projects in the area were identified. Future projects identified in the area include the SR 303L Happy Valley Parkway to 43<sup>rd</sup> Avenue and the New River Road Corridor, which runs northward from SR 74 (Figure 4-1).

##### **Planned Land Uses**

ASLD-managed lands in the study area are expected to be sold (for residential purposes) or leased (for commercial purposes), with revenues going to public schools and other State Trust beneficiaries. Future planned development in the study area includes residential, commercial, utility, and industrial uses (Figure 4-2). Commercial uses would be located primarily along the west side of I-17 from the Dixileta Drive interchange north to the Dove Valley Road interchange, and on the east and west sides of I-17 near the Dove Valley Road interchange. Residential uses are planned near the 43<sup>rd</sup> Avenue interchange and along the east side of the I-17, south of Dove Valley Road.

### 4.1.3 Impacts and Mitigation

#### **No-Build Alternative**

If the No-Build Alternative is selected, the proposed project would not be built, and SR 303L would not be connected to I-17. Future development of the area is expected to continue, and arterial roads are expected to be improved and built to support this development. Development of the area is expected to continue if the No-Build Alternative is selected, but access throughout the area may be inadequate to support future land use plans, resulting in traffic congestion.

#### **Proposed Project**

The proposed project would require the acquisition of approximately 245 acres of new right-of-way. Table 4-1 contains ownership and jurisdictional entities traversed by the proposed project and the associated aggregation of right-of-way required. The exact right-of-way required would be calculated once final design is completed.

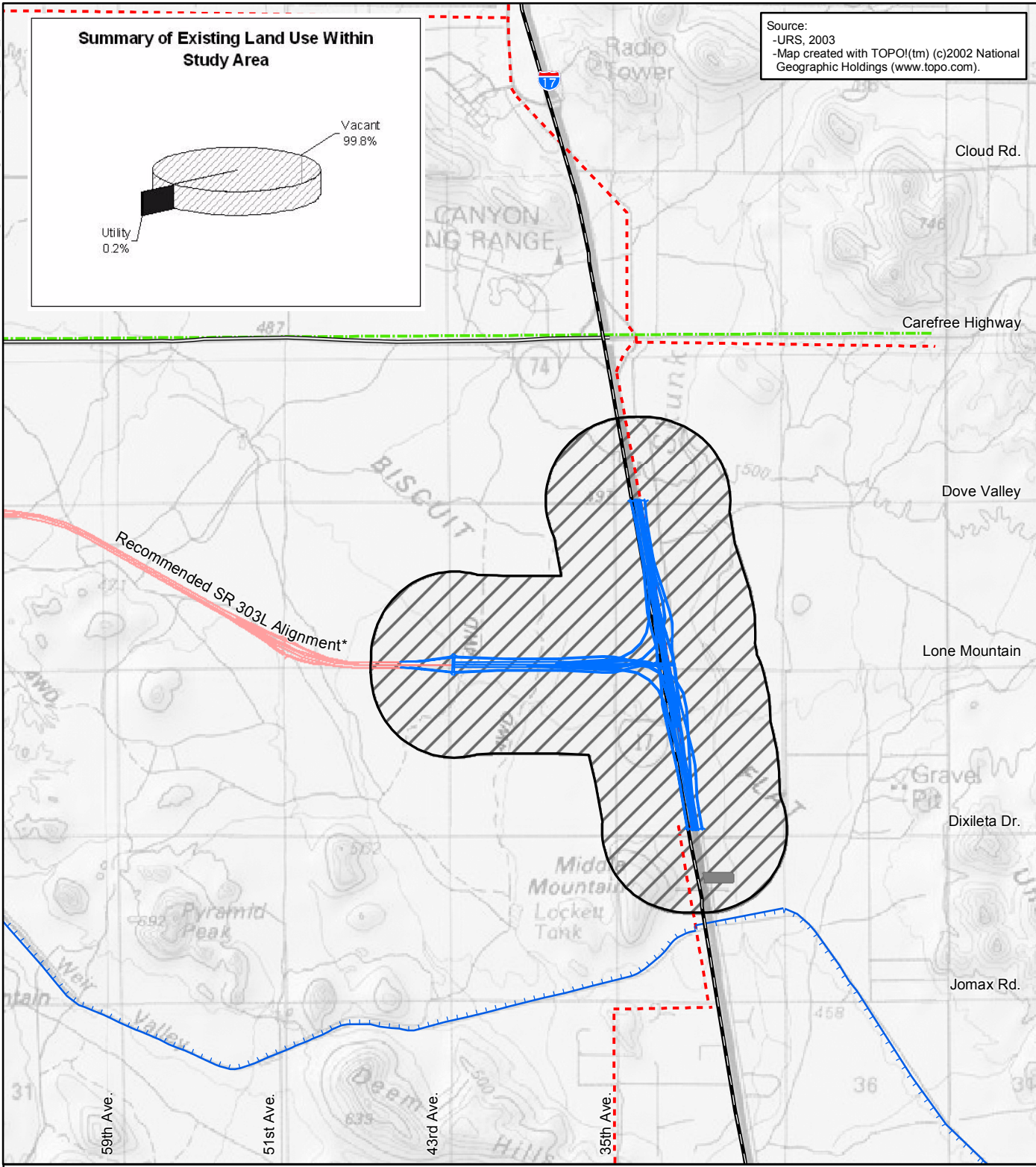
<b>Table 4-1 Approximate New Right-of-Way Requirements (Acres)</b>				
	<b>City of Phoenix</b>	<b>State Land</b>	<b>Private Property</b>	<b>Total (acres)</b>
43 <sup>rd</sup> Avenue to I-17	0	107	0	107
I-17 System Interchange	5	121	9	135
<b>Total Acres</b>	<b>5</b>	<b>228</b>	<b>9</b>	<b>242</b>

*Note: Right-of-way needs for the I-17 system interchange are over and above the needs already identified for the I-17 widening project Design Concept Report.*

Prior to implementation of the project, the ADOT Right-of-Way Group would research warranty deed information to determine the access rights to the existing frontage road along I-17. Any permits required by federal land agencies would be obtained. At least two weeks prior to construction, the Phoenix Construction District would provide a construction notice to adjacent residents and businesses.

### 4.1.4 Conclusion

The No-Build Alternative would impact planned land use in the study area due to the lack of access provided to future commercial and residential areas. Adverse impacts would be minimized under the proposed action by (1) avoiding right-of-way takings from adjacent private properties, using State Land instead, (2) maintaining access to adjacent properties, and (3) accommodating traffic volumes associated with future land development in the study area.



Source:  
 -URS, 2003  
 -Map created with TOPO! (tm) (c)2002 National Geographic Holdings (www.topo.com).

### Legend

	Study Boundary		Pipelines
	Proposed Project		Transmission Lines
	Recommended SR 303L Alignment*	<b>Land Use</b>	
	Interstate/Highway		Vacant/Undeveloped
	State Routes		Utilities
	Roads		
	Canals		

### Estrella Freeway (SR 303L) 43rd Avenue to I-17

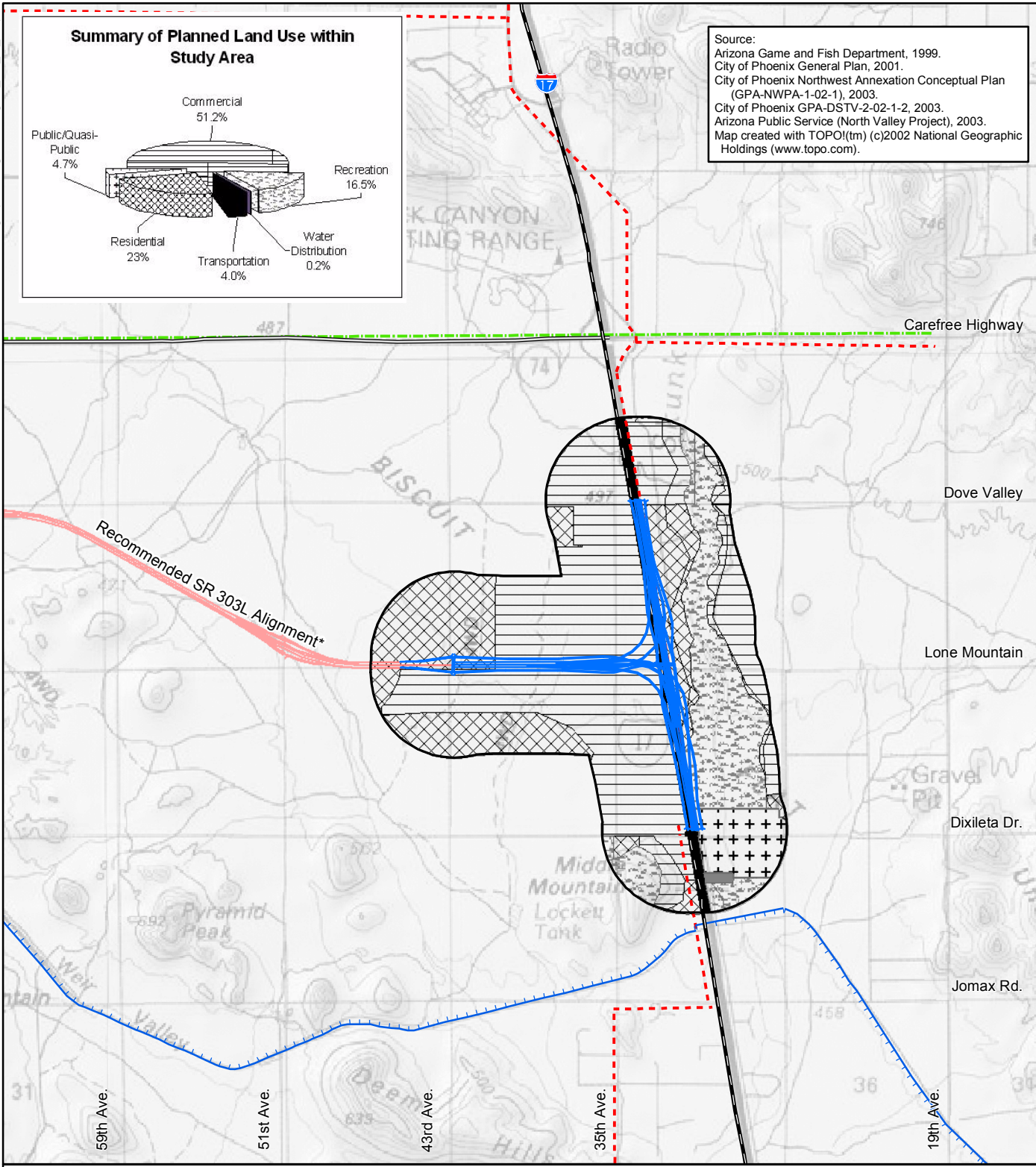
Project No. NH-303-B (AJX)  
 Tracs No. 303L MA 003 H5946 01L

### Existing Land Use

Figure 4-1

0 0.25 0.5  
 Miles

\*The recommended alignment is being evaluated in a separate EA.



### Legend

	<b>Planned Land Use</b>	

### Estrella Freeway (SR 303L)

#### 43rd Avenue to I-17

Project No. NH-303-B (AJX)  
Tracs No. 303L MA 003 H5946 01L

### Planned Land Use

Figure 4-2

\*The recommended alignment is being evaluated in a separate EA



## 4.2 WATER RESOURCES

### 4.2.1 Existing Conditions

The project study area includes Skunk Creek, a regulated floodplain (per the Federal Emergency Management Agency [FEMA] Flood Insurance Rate Map [FIRM] panels revised July 19, 2001) that has been previously identified as a jurisdictional water of the United States by the Corps. Skunk Creek is identified as a floodplain on Figure 4-3. In addition, six ephemeral washes cross the proposed project: four on the 303L segment from I-17 west to 43<sup>rd</sup> Avenue and two at drainage structures along I-17. Four of these crossings appear as blue lines on the U.S. Geological Survey (USGS) 7.5 minute quadrangle map, an indicator of potential jurisdictional waters of the United States.

The proposed project has only two large distinct drainage crossings along its entire length. This is because the I-17 alignment is perpendicular to the contours, and therefore, the offsite runoff generally flows south in small channels parallel to the I-17 alignment. Two unnamed washes, located just north of the future Dove Valley Road interchange, cross I-17 in a southwesterly direction. One crossing, located 1,650 feet north of the Dove Valley interchange, has a basin area of 0.06 square mile and a 100-year peak flow rate of 77 cubic feet per second (cfs). The other crossing, located 750 feet north of the Dove Valley interchange, has a basin area of 0.30 square mile and a 100-year peak flow rate of 246 cfs.

The ADOT *Policy and Implementation Memorandum No. 91-10* issued March 22, 1991, has established a Drainage Frequency Class for each highway on the State Highway System of Arizona. Four levels have been established, each with desired design frequencies for new construction and reconstruction. I-17 is classified as design Drainage Class 1 with the following requirements:

- Allowable headwater: 3 inches below pavement edge.
- Bridge foundations: Designed to withstand scour for the worst conditions during the 100-year event while the bridge remains functional and open to traffic. Check to ensure no failure due to scour from the occurrence of floods in magnitude between the design event and a super flood on the order of a 500-year event.
- Open channels adjacent to the highway: Designed to preclude saturation of the roadway pavement structure at the 10-year design frequency. Where overtopping would permit storm water to breakout of ADOT right-of-way, the minimum freeboard would be 1 foot.

More detailed drainage information is contained in the project's drainage report, *Design Concept Offsite Drainage Report, Estrella Freeway, SR 303L, Happy Valley Road to I-17*.

#### **4.2.2 Impacts and Mitigation**

##### **No-Build Alternative**

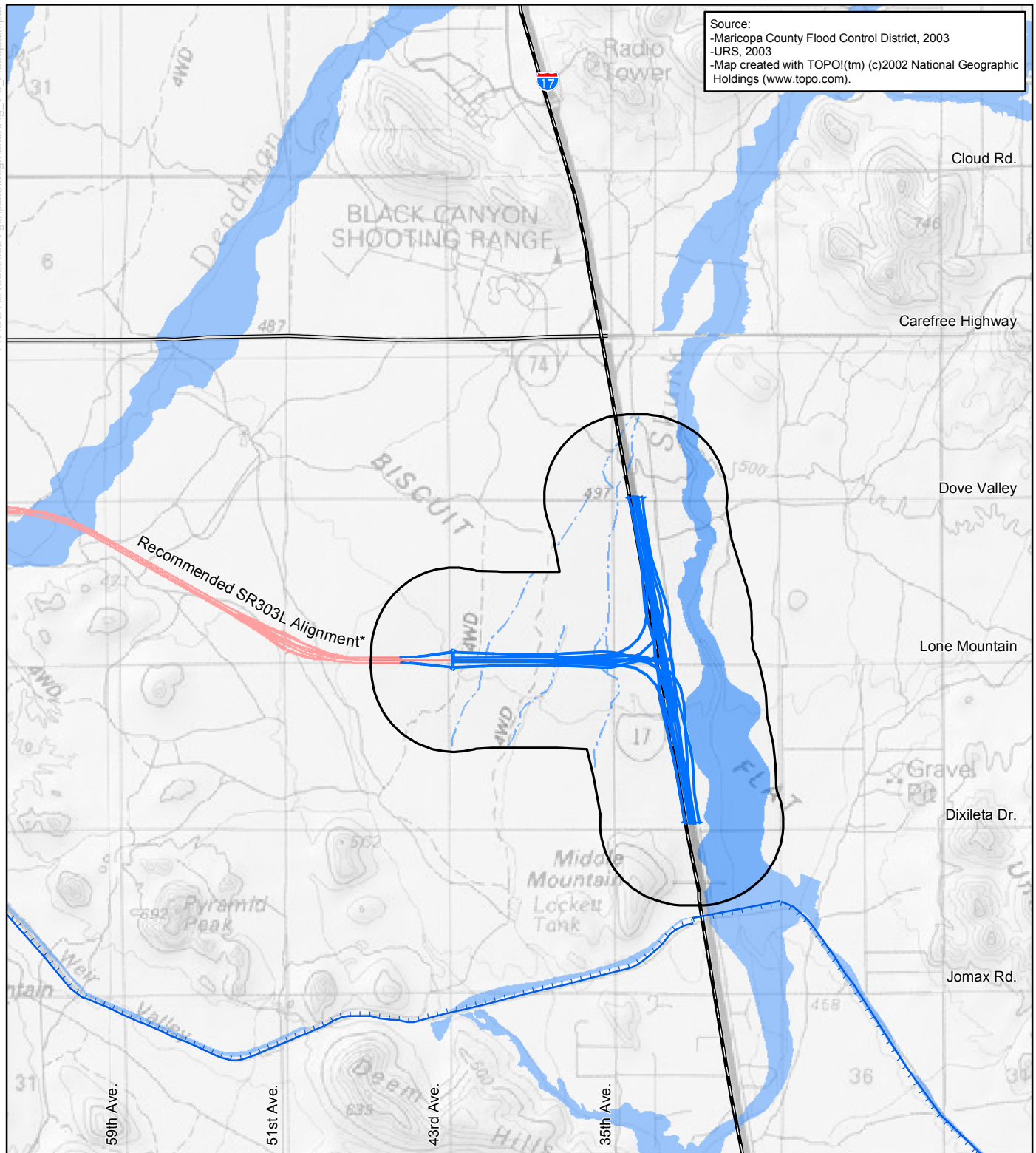
If the No-Build Alternative is selected, the proposed project would not be built. The development of land and arterials would have an effect on floodplains and drainage. Due to the lack of specific information on site development that would occur, it is difficult to assess potential impacts of the No-Build Alternative in the study area. However, federal and state regulatory requirements would continue to apply to any development proposals and likely would mitigate some potential adverse impacts.

##### **Proposed Project**

##### **Floodplains**

The proposed project was evaluated for potential impacts to the floodplain upstream and downstream of the proposed project, in accordance with 23 CFR Part 650(a), which prescribes FHWA policies and procedures for the location and hydraulic design of highway encroachments on floodplains. This regulation calls for the assessment of federally funded highway projects in terms of impacts on flood risk. Under this code, federal highway projects must avoid hazardous or incompatible use and development of floodplains; avoid longitudinal or substantial floodplain encroachment; minimize negative impacts on base flood elevations; restore and preserve natural and beneficial floodplain values; and be consistent with FEMA, state, and local government standards for administration of the National Flood Insurance program.

The proposed project does not cross any regulated floodplains. There are three proposed interchanges on I-17 with Dixileta Drive, Lone Mountain Road, and Dove Valley Road. The streets are proposed to cross I-17 but would be dead-ended just east of the ramp termini, and therefore, they would not cross the Skunk Creek floodplain as part of this proposed project. However, the proposed project does have two lateral encroachments into the Skunk Creek floodplain, which is located along the east side of I-17. The northern encroachment extends an average of 70 feet for a distance of 400 feet, at a location approximately 1,300 feet south of Lone Mountain Road. The southern encroachment extends an average of 75 feet for a distance of 650 feet, at a location approximately 900 feet south of Dixileta Drive. These relatively small encroachments (70 and 75 feet in a 2,100-foot-wide floodplain) would result in relatively small rises in the water surface elevation. Based on the current design concept, the water elevation at the northern encroachment would rise approximately 0.14 foot and dissipate to 0 feet within a distance of 0.44 mile. At the southern encroachment, the water elevation would rise about

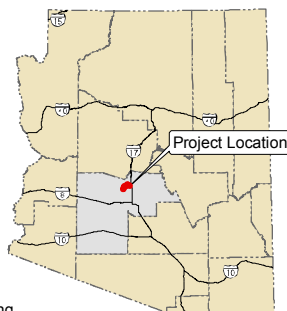


Source:  
 -Maricopa County Flood Control District, 2003  
 -URS, 2003  
 -Map created with TOPO! (tm) (c)2002 National Geographic Holdings (www.topo.com).

## Legend

- |  |   |
|--|---|
|  |   |
|  |   |
|  |   |
|  | <b>Maricopa County Flood Control District</b> |
|  |   |
|  |   |

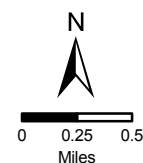
\*The recommended alignment is being evaluated in a separate EA.  
 \*\*Ephemeral washes have been identified through USGS 7.5 quadrangle mapping. They are not all inclusive and do not reflect official delineations.



## Estrella Freeway (SR 303L) 43rd Avenue to I-17

Project No. NH 303-B (AJX)  
 Tracts No. 303L MA 003 H5946 01L

## Floodplains and Washes Figure 4-3



0.13 foot and dissipate to a 0.04-foot rise in 0.46 mile. The maximum rise of 0.14 foot is too small to produce a change in the floodplain limits on the FIRM panels. During the next phase of design, ADOT would consult with FEMA to identify whether a Letter of Map Revision would be required.

The proposed project would be designed to minimize floodplain encroachments and ensure that the flood-carrying capacity of the drainages crossing the project area would not be impaired. Construction of the proposed project would not constitute a hazardous or incompatible use of floodplains; would not result in longitudinal or substantial floodplain encroachment; would not result in greater than a 1-foot rise in base flood elevations; would not impact natural or beneficial floodplain values; and would be consistent with FEMA, ADOT, and Flood Control District of Maricopa County standards regarding highway construction in floodplains.

### Offsite Drainage

The proposed project would result in increased stormwater runoff from the additional impervious roadway surfaces. These waters would be collected and conveyed by a storm-drain system for discharge into the nearest natural wash. As design of the proposed project continues, detention basins may be installed to mitigate any increases in peak runoff rates.

The proposed project would require the extension and/or replacement of existing minor culverts that convey stormwater under I-17. Because one or more acres of land would be disturbed, the ADOT Roadside Development Section would determine who would prepare the Stormwater Pollution Prevention Plan. On August 22, 2005, the Ninth Circuit Court of Appeals vacated the United States EPA delegation of Clean Water Act permitting authority to the State of Arizona. The ruling questions validity and status of permits issued and managed under the Arizona Pollution Discharge Elimination System (AZPDES), including the construction general permit for stormwater discharges and individual AZDES permits.

Because more than one acre would be disturbed, an AZPDES/National Pollution Discharge Elimination System permit would be required. The ADOT District Construction Office and the contractor would submit the Notice of Intent and Notice of Termination to the Arizona Department of Environmental Quality (ADEQ) and EPA.

### Section 404/402/401 of the Clean Water Act

Six ephemeral washes identified on USGS 7.5-minute quadrangle maps would be crossed by the proposed project (Appendix B). The acreage within these washes that would be crossed by the proposed project was estimated, based on a delineation of the ordinary high water mark, using



aerial photography (1 inch = 200 foot scale) dated 2003. The four crossings on the 303L segment would require the installation of drainage structures and would result in placing fill on a total of 0.443 acre within the washes, which is divided between the four crossings as 0.250 acre, 0.078 acre, 0.055 acre, and 0.060 acre. The two structures along I-17 would require culvert extensions and would result in placing fill on 0.303 acre within the washes, which is divided between the two crossings as 0.036 acre and 0.267 acre.

Coordination with the Corps is required to complete the jurisdictional delineation to formally define whether these washes are jurisdictional waters of the United States, identify permit requirements under Sections 401 and 404 of the Clean Water Act, and mitigate potential impacts as the design of the proposed project goes forward.

According to ADOT's *Standard Specifications for Road and Bridge Construction* (ADOT 2000), Section 104, "Scope of Work," Subsection 09, "Prevention of Landscape Defacement; Protection of Streams, Lakes, and Reservoirs," ADOT would ensure that, "[t]he contractor would take sufficient precautions, considering various conditions, to prevent pollution to streams, lakes, and reservoirs with fuels, oils, bitumens, calcium chloride, fresh Portland cement, raw sewage, muddy water, chemicals, or other harmful materials. None of these materials would be discharged into any channels leading to such streams, lakes, or reservoirs" and according to Subsection 09, "[t]he contractor would give special attention to the effect of its operations on the landscape and would take special care to maintain natural surroundings undamaged."

#### **4.2.3 Conclusion**

The proposed project is not anticipated to adversely impact floodplains or drainage. Project design would go forward in consultation with FEMA and the Corps to identify and mitigate potential impacts. It is anticipated that this project would be covered by a series of Nationwide Section 404 permits. Some may require a pre-discharge notification.

### **4.3 BIOLOGICAL RESOURCES**

#### **4.3.1 Biotic Communities**

The project area is located in the Arizona Upland Subdivision of Sonoran Desertscrub, as described by Brown (1994). Native vegetation representative of this subdivision and soil types include mesquite (*Prosopis* spp.), ironwood (*Olneya tesota*), catclaw (*Acacia greggii*), saguaro (*Carnegiea gigantea*), whitethorn (*Acacia constricta*), creosotebush (*Larrea tridentata*), cacti, bursage (*Ambrosia* spp.), and annual grasses. Riparian vegetation is dominated by a combination of low, medium-sized mesquites, catclaw, paloverde (*Cercidium* spp.), desert willow (*Chilopsis*

*linearis*), and ironwood. Landscaped areas are composed of both native and nonnative vegetation.

Riparian habitat in the project area includes Skunk Creek and its tributaries, all of which drain from the New River Mountains. They are ephemeral; they flow only in direct response to precipitation in the immediate area. In addition, the channels are always above the zone of saturation. Riparian ecosystem conditions have responded to the patterns of flooding, groundwater fluctuations, and impoundment structures (Briggs 1996).

#### **4.3.2 Wildlife**

Typically, plant communities that occur within the Arizona Uplands provide suitable habitat for a diverse group of birds, mammals, reptiles, and amphibians; however, regional and local urban growth has altered wildlife presence and movement by disturbing and eliminating their habitats. In urban settings, the ephemeral drainages become important to the survival of most species. Skunk Creek and its tributaries are present in the project area.

Species observed along Skunk Creek from the Central Arizona Project (CAP) canal to Carefree Highway include red-tailed hawk (*Buteo jamaicensis*), great-horned owl (*Bubo virginianus*), western screech owl (*Otus kennicottii*), Harris' hawk (*Parabuteo unicinctus*), Gambel's quail (*Callipepla gambelii*), lesser goldfinch (*Carduelis psaltria*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), javelina (*Pecari tajacu*), Cooper's hawk (*Accipiter cooperii*), desert spiny lizard (*Sceloporus magister*), desert cottontail, and western diamond-backed rattlesnake (*Crotalus atrox*) (Garrison 2000).

#### **No-Build Alternative**

If the No-Build Alternative is selected, the proposed project would not be built, and SR 303L would not be connected to I-17. Future development of the area is expected to continue and arterial roads likely would be extended or developed to support this growth, impacting naturally occurring native vegetation in the area. Due to the lack of specific information on site development that could occur, it is difficult to assess potential impacts of the No-Build Alternative in the project area.

#### **Impacts of Proposed Project**

With the application of mitigation, populations of animals would not be affected by the proposed project because disturbance would occur along habitat that has been degraded by urbanization and roadway development. Habitat along I-17 is unsuitable for most wildlife; however, better quality habitat exists along Skunk Creek and its tributaries. In these riparian areas, vegetation is

more diverse and abundant, and provides movement corridors for wildlife. Vegetation in the western fringes of the floodplain is open, low, and relatively disturbed.

The proposed project would encroach on the floodplain for an average of 70 feet for a distance of 400 feet at a location approximately 1,300 feet south of Lone Mountain Road. The southern encroachment extends an average of 75 feet for a distance of 650 feet at a location approximately 900 feet south of Dixileta Drive. The three proposed interchanges on I-17 include future streets on Dixileta Drive, Lone Mountain Road, and Dove Valley Road. The streets are proposed to cross I-17 but would be dead-ended just east of the ramp termini. They would not cross the Skunk Creek floodplain as part of this proposed project.

Individual animals may be impacted during construction by eliminating components of wildlife habitat in the disturbed upland plant communities and temporarily displacing individuals during construction. Construction activities may also cause mortality to small burrowing animals. However, animals that utilize Skunk Creek for foraging, traveling, sheltering, or nesting would not be impacted by this proposed project.

Approximately six ephemeral washes may be affected by the project (see Section 4.2, Water Resources). Four of the crossings would occur west of I-17 and would include the placement of drainage structures. The remaining two crossings would occur north of the proposed SR 303L along I-17, and would include the placement of two culverts. Temporary disturbance of washes, and therefore to wildlife movement, would occur during construction; however, no permanent impacts to wildlife, wildlife movement, or habitat connectivity would result from this activity. Once drainage structures are placed, wildlife would resume movement along Skunk Creek and its tributaries and would be able to traverse the SR 303L north/south utilizing the proposed drainage structures.

## **Mitigation**

To lessen or avoid potential impacts to general wildlife in the project area, removal or disturbance of vegetation would be minimized through project design as practicable. In areas where native vegetation must be removed, natural conditions would be restored by reseeding with species native to the area, and by replacing trees and shrubs with native species instead of landscaping with exotic species. The placement of culverts along drainage and wash crossings would maintain habitat connectivity opportunities after construction. As identified in the Design Concept Report (URS 2005b), culverts in the project area would range in size from 6 feet by 6 feet to 8 feet by 8 feet. During final design, ADOT would coordinate with Arizona Game and Fish Department to address further concerns regarding habitat connectivity. In addition, culvert sizes and locations may be modified to accommodate the final design of the project.

## **Conclusion**

The proposed project may have short-term effects on individual animals or their habitats during construction; however, by adhering to the mitigation measures, impacts would be avoided or lessened.

### **4.3.3 Threatened and Endangered Species**

A list of federally listed endangered, threatened, proposed, and candidate species was obtained from the U.S. Fish and Wildlife Service Arizona Ecological Services Web site (2004). Twelve species were reviewed by a qualified biologist (Jean Paul Charpentier, URS). Of the total, one federally listed endangered species, the lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) has the potential for occurring within the project area. Federally listed threatened species include the bald eagle (*Haliaeetus leucocephalus*). The previously-listed endangered cactus ferruginous pygmy owl (*Glaucidium brasilianum* cactorum) is included here for discussion in the event that, through potential future litigation, the species is re-listed. In addition to the federally listed species, one sensitive species, the Sonoran desert tortoise (*Gopherus agassizii*), has the potential of occurring in the project area. For a list of federally listed species excluded from further evaluation and the reasons for their exclusion, please see the Biological Evaluation (URS 2004d).

### **No-Build Alternative**

If the No-Build Alternative is selected, the proposed project would not be built, and SR 303L would not be connected to I-17. Future development of the area is expected to continue and arterial roads likely would be extended or developed to support this growth. Due to the lack of specific information on site development that could occur, it is difficult to assess potential impacts of the No-Build Alternative in the project area. However, federal and state regulatory requirements would continue to apply to any development proposals that might affect federally listed species.

### **Impacts of Proposed Project**

#### **Bald Eagle**

The nearest known bald eagle nest is located on Lake Pleasant, approximately 20 miles northwest of the project area. The home range of a nesting pair typically does not exceed 16 miles around the nest site; therefore, the species is not anticipated to utilize habitat within the project area for nesting or foraging. Bald eagles typically utilize habitats that include large trees, and cliffs near water with abundant fish and waterfowl. The habitat within the project area lacks these characteristics and is therefore unsuitable for bald eagles. Therefore, the proposed project would not affect the bald eagle or its habitat.



### Cactus Ferruginous Pygmy-Owl

Within the study area, Skunk Creek and its tributaries do not provide suitable habitat components for the cactus ferruginous pygmy-owl. Vegetation density and structural diversity is low to moderate, with little cover or roosting vegetation available.

Currently, cactus ferruginous pygmy-owls have very limited distribution in Arizona, and it is highly unlikely that owls would migrate north into the northern edge of their geographical range of central Arizona. Suitable habitat located on the east side of I-17 north of I-10 has been identified as survey zone 3 for the cactus ferruginous pygmy-owl. Numerous surveys have been conducted in Maricopa County in recent years and have produced no record of owls. Manmade barriers for the owl include fragmented habitat and elimination of suitable habitat due to accelerated urban development. In addition, the nearest known owl is located in northwest Tucson in Pima County, nearly 150 miles away.

### Lesser Long-Nosed Bat

The nearest bat roost is located at Picacho Peak in Pinal County, approximately 100 miles south of the project area. The foraging range of the bat is approximately 40-45 miles each night from a roost site.

In Arizona, from April through July, females are found mostly in areas with flowering saguaros at elevations below 3,500 feet. During July, their range expands into elevations up to 5,500 feet to include agave blossoms. By late September, all lesser long-nosed bats have departed Arizona for the winter. Habitat within the project area includes columnar cacti such as saguaros and one or two species of agaves; however, the abundance of this vegetation within the project area is low, providing little foraging opportunity for this species. The project area is not considered suitable habitat, and therefore the proposed project would not affect the lesser long-nosed bat or its habitat.

### **Mitigation**

No mitigation measures would be necessary.

### **Conclusion**

The proposed project would have no effect on the threatened bald eagle, endangered lesser long-nosed bat, or recently de-listed cactus ferruginous pygmy owl; therefore, no mitigation measures would be required.

#### **4.3.4 Sensitive Species**

##### **Sonoran Desert Tortoise**

The Sonoran population of the desert tortoise has no federal status under the Endangered Species Act; however, it is included as Wildlife of Special Concern in Arizona by the Arizona Game and Fish Department. Typically, the Sonoran desert tortoise occurs on bajadas in paloverde-mixed cacti associations in the Arizona Upland Subdivision. Adequate shelter is one of the most important habitat components of tortoises in the Sonoran Desert. They require loose soil in which to dig burrows below boulders and rocks, sometimes under vegetation. In washes and in particular, portions of Skunk Creek, they may use caliche caves in the incised wash banks. In addition to potential burrow sites, plants that tortoises feed on occur primarily along wash banks, and to a lesser degree, at the edge of a road-bed.

##### **No-Build Alternative**

If the No-Build Alternative is selected, the proposed project would not be built, and SR 303L would not be connected to I-17. With this alternative, desert tortoise habitat would not be disturbed or eliminated; however, future development of the area is expected to continue and arterial roads likely would be extended or developed to support this growth. As a result, impacts to desert tortoises and their habitats are expected to occur in the general vicinity.

##### **Impacts of Proposed Project**

Skunk Creek flows southwest, generally parallel to I-17 within the project area. Typically, tortoises would not move away from washes (except during flood events) if their needs (e.g., forage plants) are met along the washes and immediate upland areas, especially where boulders and hillsides are located. The hillsides and smaller washes that would provide suitable habitat for the desert tortoise are located east of Skunk Creek and away from I-17 to the east. I-17 appears to be a partial barrier between tortoise habitat near Skunk Creek and the project area primarily because it contains less suitable habitat. However, there is potential for incidental tortoise occurrence because of the proximity to suitable tortoise habitat. Because suitable habitat is present in the project vicinity, individual desert tortoises or their habitat may be impacted.

##### **Mitigation**

Suitable Sonoran desert tortoise habitat exists in the project area; therefore, mitigation measures may be needed. The Arizona Game and Fish Department has developed guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term projects such as roadway construction. AGFD's *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development*

*Projects* is included as Appendix C. The contractor would adhere to provisions of the guidelines in the event that a tortoise is encountered during construction. Additionally, the sizing and installation of culverts and drainage structures, as discussed in Section 4.3.2, may provide opportunities to maintain habitat connectivity and reduce mortality from vehicle collisions during the life of the project.

### Conclusion

Individual tortoises may be encountered, but by adhering to the mitigation measures, impacts would be avoided or minimized. Implementation of the proposed project would not result in a trend towards federal listing of this species.

### **4.3.5 Protected Native Plants**

#### **Arizona Native Plant Law Species**

The Arizona Native Plant Law (ANPL) applies to listed plants that are naturally occurring, but not to landscaped or planted individuals. Native plants that are protected by the ANPL include all cacti, yucca, agave, and many leguminous tree species such as paloverdes, mesquites, and ironwoods that are naturally occurring at their location. Jean Paul Charpentier of URS surveyed the project area on May 29, 2003, for protected native plants listed by the Arizona Department of Agriculture (ADA). Foothill paloverde (*Cercidium microphyllum*), ocotillo (*Fouquieria splendens*), velvet mesquite (*Prosopis velutina*), catclaw acacia (*Acacia greggii*), Arizona barrel cactus (*Ferocactus wislizenii*), and saguaro (*Carnegiea gigantea*) were found in the area, but no species were found in dense numbers.

#### **No-Build Alternative**

If the No-Build Alternative is selected, the proposed project would not be built, and SR 303L would not be connected to I-17. Future development of the area is expected to continue and arterial roads likely would be extended or developed to support this growth, impacting native plants protected by the Native Plant Law. Due to the lack of specific information on site development that could occur, it is difficult to assess potential impacts of the No-Build Alternative to protected native plants. However, state regulatory requirements would continue to apply to any development proposals.

#### **Impacts of Proposed Project**

Protected native plants within the project limits would be impacted by this project. The proposed project would require the removal of native plants, grading of surface soils, and construction of roadway surface structures across undeveloped desertscrub plant communities.

## **Mitigation**

The ADOT Roadside Development Section would notify the Arizona Department of Agriculture at least 60 days prior to the start of construction so that the ADA can determine the disposition of any protected native plants occurring within the project limits.

## **Conclusion**

The project may impact protected native plants; however, by following the provisions of the ANPL and notifying the ADA, impacts may be avoided or minimized.

### **4.3.6 Invasive Species**

Under Executive Order 13112, dated February 3, 1999, projects that occur on federal lands or are federally funded must, “subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to, and control, populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably ... ; [and] (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded.”

A current list of Arizona noxious weeds is provided in Appendix D. This assessment assumes that noxious weeds would be present within the project area both under the No Build Alternative, and with the Proposed Project at the time of construction. Therefore, the mitigation measures outlined below would be implemented.

## **Mitigation**

To prevent the introduction of invasive species seeds, all construction equipment would be washed prior to entering the construction site. To prevent invasive species seeds from leaving the site, the contractor would inspect all equipment and remove attached plant/vegetation debris prior to leaving the construction site. All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity.

### **4.3.7 Summary Conclusion**

The proposed project would have no effects to endangered and threatened species; therefore, no mitigation measures for endangered and threatened species would be required. The proposed project may impact individual desert tortoises or their habitat; however, impacts could be avoided or minimized by adhering to the mitigation measures. The proposed project would



impact protected native plants. These impacts would be mitigated by notifying the Arizona Department of Agriculture and by revegetating disturbed areas with native plant species. Preventing the potential spread of invasive weed species would be accomplished by implementing the mitigation measures.

## **4.4 VISUAL RESOURCES**

### **4.4.1 Existing Conditions**

Existing conditions associated with visual resources are evaluated through an assessment of landscape character, scenic quality, and sensitive viewers in the study area.

#### **Landscape Character**

The project study area occurs within an area designated as the Sonoran Desert landscape character type. Notable regional natural features include the White Tanks Regional Park (west of the study area), Estrella Mountain Regional Park (in the south distant background), Agua Fria River, and Lake Pleasant (northwest of the study area); all are designated as natural open-space features. The majority of the natural landscape settings can be characterized as relatively flat, open desert plains, dissected by intermittent riparian tributaries and isolated mountain and foothill lands.

The vegetation within the study area is characteristic of typical Sonoran Desert native vegetation. The prominent vegetation community can be characterized as southwestern desertscrub, as described by Charles Lowe (1964). The vegetative palette is composed of numerous species of trees (foothill paloverde, ironwood, saguaro, and mesquite), cacti (barrel, cholla, prickly pear), creosotebush, brittlebush, and scrubgrasses.

#### **Scenic Quality Assessment**

Scenic quality is described as the effect created by the particular elements, either natural or man-made, that constitute the visual content or natural amenities of a given setting. A landscape's scenic quality is determined by evaluating the uniqueness and diversity of interest of its contents, including landform, vegetation, water, cultural features, and the effects of adjacent scenery. Specific evaluations are then used to rank landscapes according to their relative distinctive quality.

The different landscape areas within the larger study area were characterized according to the following scenic quality classifications to identify their relative scenic value. Generally, landscapes falling within Class A are those that contain a greater amount of scenic interest and diversity (e.g., areas around Lake Pleasant and along portions of the Agua Fria River and New

River), while those falling within Class C are areas that contain the least scenic interest and diversity (e.g., flat desert scrub land).

- Class A – Areas of outstanding diversity or interest; characteristic features of landform, rock, water, and vegetation are distinctive or unique in relation to the surrounding region. These areas contain considerable variety in form, line, color, and texture.
- Class B – Areas of above-average diversity or interest providing some variety in form, line, color, and texture. The features are not considered rare in the surrounding region, but provide adequate visual diversity to be considered fairly unique.
- Class C – Areas of minimal diversity or interest where representative features have limited variation in form, line, color, or texture in the context of the surrounding region.

Figure 4-4 shows the results of an assessment of scenic quality in the vicinity of the proposed project. Landscapes within the project study area are primarily Class C landscapes (83 percent) with very few occurrences of Class B (1 percent) and Class A (16 percent) landscapes.

### **Sensitive Viewers**

I-17 can be characterized as a commuter route. Existing development is limited in the vicinity of the proposed project. Travelers along I-17 would have views of the proposed project, as would hikers on existing trails within the area.

#### **4.4.2 Impacts and Mitigation**

##### **No-Build Alternative**

If the No-Build Alternative is selected, the proposed project would not be built. Future development of the area is expected to continue and arterial roads are expected to be improved and built to support this development. Impacts on visual resources associated with the No-Build

Alternative are anticipated to be low based on the (1) limited scenic value and (2) lack of sensitive viewers in the project area.

##### **Proposed Project**

Potential impacts on visual resources associated with the proposed project are anticipated to be low, based on (1) limited scenic value, (2) the lack of sensitive viewers in the project area, and (3) design components incorporated into the project description that would be effective in reducing impact levels. These components include the construction of project features using materials that complement the surrounding landscape's colors and textures. In addition, retaining walls associated with any rock cuts would be compatible with the rugged forms, textures, colors,

and lines of the surrounding setting and with those of the new retaining walls, to the extent practicable. Required bridges would be painted to blend with the desert nature of their surroundings, to the extent practicable.

#### **4.4.3 Conclusion**

Currently, lands within the project area are undeveloped, or developed for commercial and mixed land uses; their scenic qualities have been assessed as low. It therefore is not likely that either the No-Build Alternative or the proposed project would adversely affect visual resources, based on existing conditions.

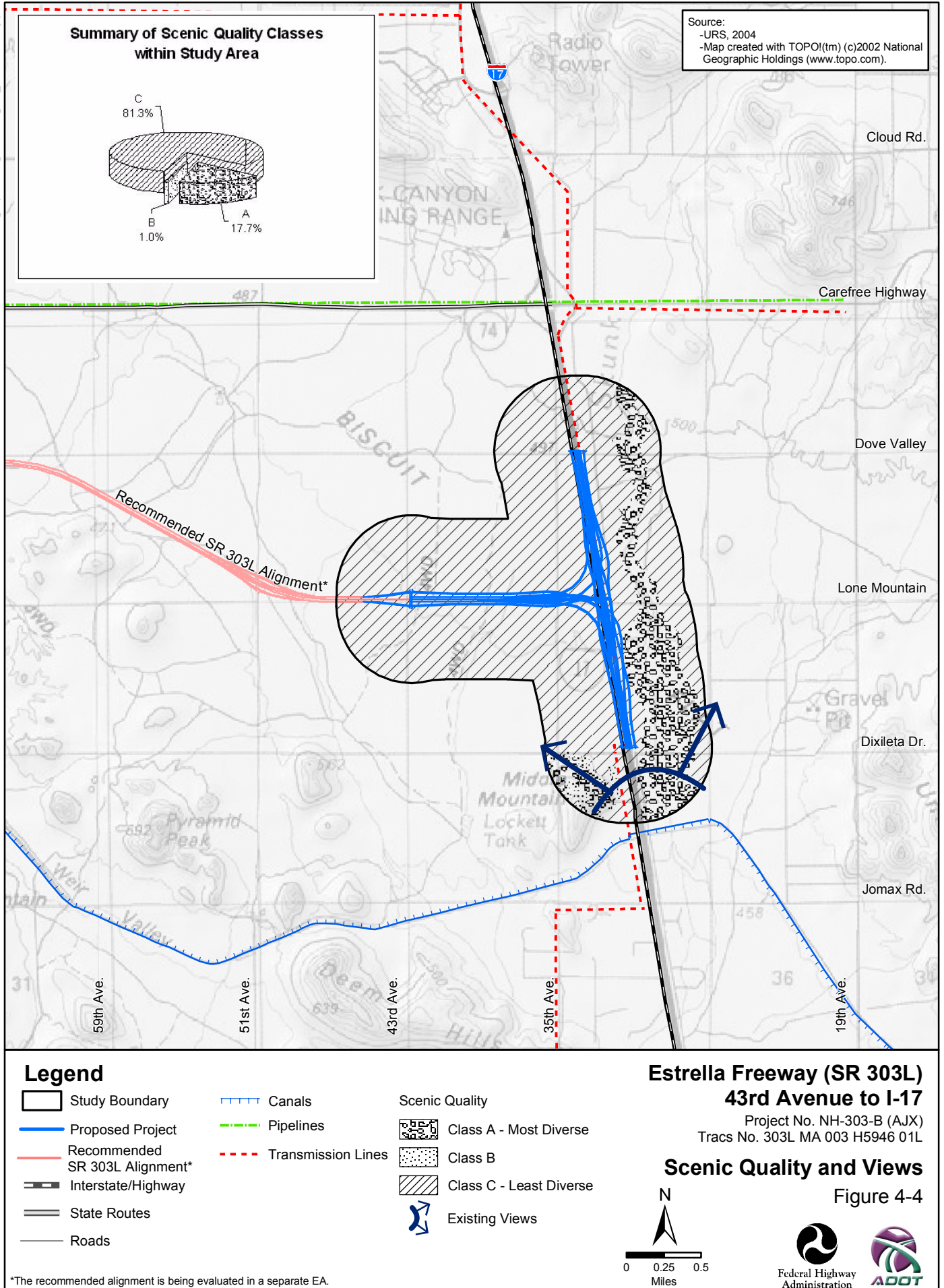
### **4.5 AIR QUALITY**

#### **4.5.1 Existing Conditions**

The National Ambient Air Quality Standards (NAAQS) were established by the federal Clean Air Act of 1970, as amended in 1977 and 1990. The NAAQS represent the maximum levels of pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. The six primary air pollutants of concern for which NAAQS have been established are ozone (O<sub>3</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), lead (Pb), and particulate matter equal to or less than 10 microns in aerodynamic diameter (PM<sub>10</sub>).

On July 18, 1997, the U.S. Environmental Protection Agency (EPA) redefined NAAQS for O<sub>3</sub> and particulate matter. The NAAQS for O<sub>3</sub> is 0.08 parts per million (ppm) averaged over 8 hours. The NAAQS for particulate matter added another category for smaller particles—PM<sub>2.5</sub> (particulate matter with an aerodynamic diameter equal to or smaller than 2.5 microns) must not exceed an annual average of 15 micrograms per cubic meter (µg/m<sup>3</sup>) and a 24-hour average of 65 µg/m<sup>3</sup>. The PM<sub>10</sub> standards were essentially retained. Although standards for PM<sub>2.5</sub> were developed, very few monitors currently record data for PM<sub>2.5</sub> in the metropolitan Phoenix area. In future years, it is anticipated that additional monitors would be located in the metropolitan Phoenix area to measure levels of PM<sub>2.5</sub> in the ambient air.

Portions of Maricopa County, including the study area, are designated as nonattainment areas according to the NAAQS for O<sub>3</sub>, CO, and PM<sub>10</sub>. however, on January 5, 2005, the EPA redesignated the Maricopa County area to attainment with a maintenance plan for the CO standard. The Clean Air Act sets planning requirements to ensure attainment of the NAAQS by specific deadlines. Foremost among these requirements is adoption and implementation of air



\*The recommended alignment is being evaluated in a separate EA.



quality attainment plans. Air quality planning documents that have been prepared to address CO, O<sub>3</sub>, and PM<sub>10</sub> issues associated with the Maricopa County nonattainment area are:

- *One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*
- *Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area*
- *Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*
- *Revised 1998 15 percent Rate of Progress Plan for Ozone (Revised ROP FIP) for the Maricopa County Nonattainment Area*
- *Final Serious Area Ozone State Implementation Plan for Maricopa County*
- *Revised MAG 1999 Serious Area Particulate Plan for PM<sub>10</sub> for the Maricopa County Nonattainment Area*

The Maricopa County Environmental Services Department (MCESD) has jurisdiction over air quality programs in Maricopa County, including the project area. Maricopa County Air Pollution Control Rules & Regulations, developed by MCESD, also are applicable to the proposed project. These rules and regulations constitute the legal basis for control of air pollution sources in Maricopa County.

The MCESD operates a series of air quality monitoring stations throughout the metropolitan Phoenix area. The existing air quality data for CO, PM<sub>10</sub>, and O<sub>3</sub> were collected from the Glendale monitoring station at 6000 West Olive Avenue. To characterize existing air quality in the project study area, the data monitored at this station during the most recent years available (1999 to 2003) were evaluated. As noted in Table 4-2, the Glendale monitoring data showed no exceedances of the NAAQS for CO, O<sub>3</sub> (8-hour average), and PM<sub>10</sub> (annual average). However, the maximum readings for O<sub>3</sub> (1-hour average) exceeded the NAAQS level each year, and the maximum readings for PM<sub>10</sub> (24-hour average) barely exceeded the NAAQS level during 2003.

<p align="center"><b>Table 4-2</b> <b>Maximum Pollutant Readings from the Glendale Air Quality Monitor</b></p>						
<b>Pollutant</b>	<b>NAAQS</b>	<b>1999<sup>1</sup></b>	<b>2000<sup>2</sup></b>	<b>2001<sup>3</sup></b>	<b>2002<sup>4</sup></b>	<b>2003<sup>5</sup></b>
<b><i>Carbon Monoxide (CO)</i></b>						
1-hour Average	35 ppm	5.7 ppm	4.6 ppm	4.7 ppm	4.1 ppm	5.7 ppm
8-hour Average	9 ppm	3.8 ppm	3.5 ppm	3.1 ppm	3.2 ppm	2.4 ppm
<b><i>Ozone (O<sub>3</sub>)</i></b>						
1-Hour Average	0.08 ppm	<b>0.108 ppm</b>	<b>0.100 ppm</b>	<b>0.116 ppm</b>	<b>0.101 ppm</b>	<b>0.107 ppm</b>
8-Hour Average	0.12 ppm	0.083 ppm	0.088 ppm	0.092 ppm	0.094 ppm	0.092 ppm
<b><i>Particulate Matter less than 10 Microns in Diameter (PM<sub>10</sub>)</i></b>						
24-Hour Average	150 µg/m <sup>3</sup>	77 µg/m <sup>3</sup>	122 µg/m <sup>3</sup>	110 µg/m <sup>3</sup>	88 µg/m <sup>3</sup>	<b>151 µg/m<sup>3</sup></b>
Annual Average	50 µg/m <sup>3</sup>	36.3 µg/m <sup>3</sup>	40.8 µg/m <sup>3</sup>	33.0 µg/m <sup>3</sup>	40 µg/m <sup>3</sup>	36 µg/m <sup>3</sup>

Notes: Exceedances of the NAAQS are indicated in bold

<sup>1</sup> ADEQ, Annual Report 2000, Appendix I Air Quality Report, 2000

<sup>2</sup> ADEQ, Annual Report 2001, 2001

<sup>3</sup> ADEQ, Annual Report 2002, 2002

µg/m<sup>3</sup> – micrograms per cubic meter

<sup>4</sup> ADEQ, Annual Report 2003, 2003

<sup>5</sup> ADEQ, Annual Report 2004, 2004

## Conformity

The 1990 Clean Air Act Amendments and the federal conformity rule (40 CFR Parts 51 and 93) require transportation projects to conform to (be consistent with) air quality implementation plans. The conformity rule applies nationwide to “all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan” (40 CFR Part 93.102). To be a conforming project, it must be a part of an approved transportation plan and program and must not result in violations of the federal CO standard in the area substantially affected by the project as shown by a project-level analysis.

MAG is the designated Metropolitan Planning Organization in Maricopa County, Arizona, and is responsible for regional transportation and air quality planning. The proposed project is contained within the current MAG RTP and program (Fiscal Year 2004-2007 Special MAG Transportation Improvement Program). The programs are assimilated into the Statewide Transportation Improvement Program after demonstration that the proposed programs comply with the State Implementation Plan for attaining the NAAQS. On December 9, 2003, the FHWA determined that the RTP conforms to the State Implementation Plan.

## Climate/Meteorology

Meteorological and climatological conditions influence ambient air quality. Temperatures in the project area are typical of desert climatology, ranging from 40 to 45 degrees Fahrenheit (°F) during the winter to more than 100°F during the summer. Precipitation in the area is sparse and is limited primarily to rainfall, although traces of snow have been reported in this area. Rainfall occurs primarily from July through March. Large amounts of warm, moist air moving from the Gulf of Mexico can create heavy thunderstorms across Arizona. The prevailing wind direction in this area is from the east, with an annual mean speed of 6.2 miles per hour.

## **4.5.2 Impacts**

### **No-Build Alternative**

#### **Temporary Impacts**

Under the No-Build Alternative, construction of new arterial roads and extension of existing roads would occur to serve area development. As a result, air emissions associated with construction activities as they relate to arterial roads would occur; however, these impacts would be short-term in nature and could be mitigated as described in Section 4.5.3 - Mitigation.

#### **Permanent Impacts**

According to the traffic report prepared for this project, congestion would increase because the arterial roads network would not move traffic as efficiently as on the SR 303L. To quantify impacts to air quality under the No-Build Alternative, project-level CO modeling was performed using the EPA-approved CAL3QHC dispersion model. Ambient CO levels are highest near congested intersections and roadway segments; therefore, to predict the worst-case (maximum) CO impacts, the CO modeling analysis focused on the area that would be expected to be the most congested, if the proposed project were not constructed. According to the No-Build traffic projections provided by MAG for the year 2030, the I-17/Dove Valley Road interchange vicinity would experience the highest traffic volumes of the interchanges or intersections within the study area (mainly from Dove Valley Road traffic combined with traffic from the I-17 mainline, ramps, and frontage roads). As a result, the I-17/Dove Valley Road interchange was selected for air quality dispersion modeling analysis as a worst-case condition.

MOBILE6.2 was used to estimate composite CO emission factors for vehicles in traveling and idling situations. A summary of the estimated total maximum CO concentrations for the No-Build Alternative, including background CO concentrations, is presented in Table 4-3. As shown in Table 4-3, the maximum total 1-hour and 8-hour CO concentrations estimated for the project area would be 6.7 and 4.7 parts per million, respectively, which are well below the NAAQS for CO.

<b>Table 4-3</b> <b>Comparison of Maximum CO Concentrations Between the No-Build Alternative and the Proposed Project</b>				
	<b>No-Build Alternative Maximum Total Concentrations (ppm)</b>		<b>Proposed Project Maximum Total Concentrations (ppm)</b>	
	<b>1-hour</b>	<b>8-hour</b>	<b>1-hour</b>	<b>8-hour</b>
Predicted CO concentrations	6.7	4.69	4.40	3.08
NAAQS (ppm)	35	9	35	9
Exceeds Standard	No	No	No	No

Source: URS 2004b

## **Proposed Project**

### Temporary Impacts

Construction-related soil disturbance and operation of heavy equipment would produce an increase in particulate matter during roadway construction, but these impacts would be short-term in nature and mitigated as described in Section 4.5.3 - Mitigation.

### Permanent Impacts

To predict the worst-case (maximum) CO impacts for the proposed project, the CO modeling analysis focused on the most congested area. A summary of the estimated total maximum CO concentrations for the most congested area within the project area, including background CO concentrations, is presented in Table 4-3. As shown in Table 4-3, the maximum total 1-hour and 8-hour CO concentrations estimated for the project area would be 4.4 and 3.08 parts per million, respectively, which are well below the NAAQS for CO. These concentrations are less than those predicted for the worst-case No-Build Alternative; therefore, the proposed project would be expected to improve overall air quality within the area affected by the project.

## **Mobile Source Air Toxics**

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

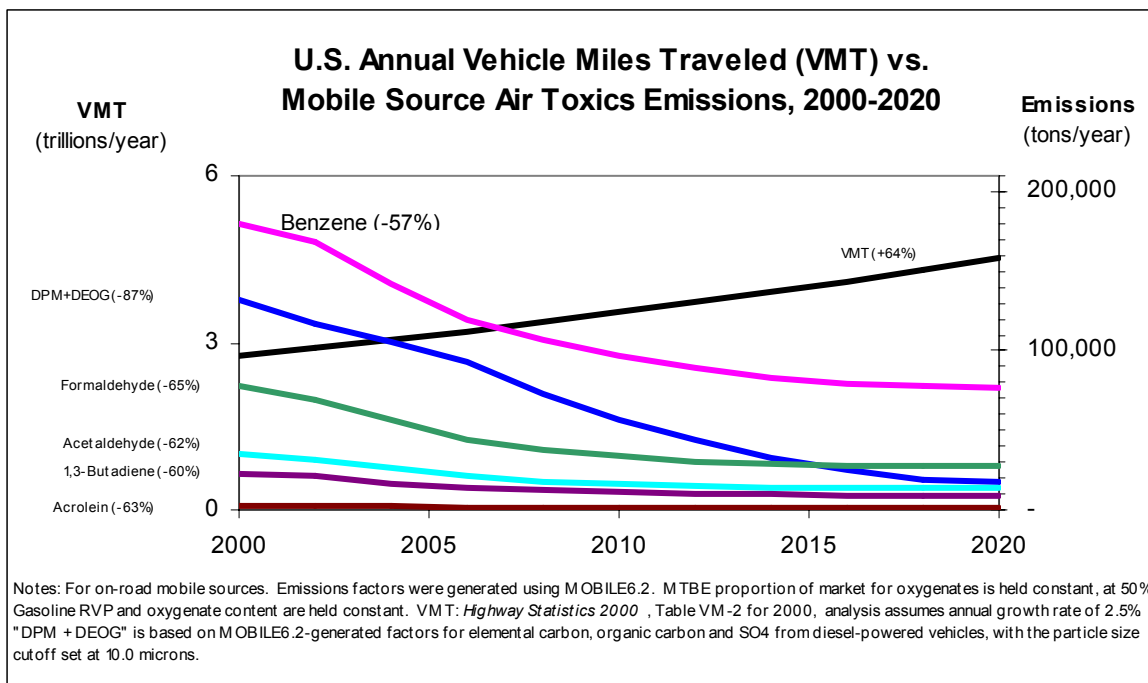
Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels



or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act (CAA). In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between the years 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs would reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and would reduce on-highway diesel PM emissions by 87 percent, as shown in the following graph, Figure 4-5.

**Figure 4-5**



As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that would address these issues and could make adjustments to the full 21 and the primary six MSATs.

## Unavailable Information for Project Specific MSAT Impact Analysis

This EA includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable the prediction of project-specific health impacts of the emission changes associated with the No-Build and Build Alternatives in this EA. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

***Information that is Unavailable or Incomplete:*** Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. *Emissions:* The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE 6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE 6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

2. *Dispersion:* The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a

decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also would focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

3. Exposure Levels and Health Effects: Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, between the No-Build and Build Alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating*

*Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: [www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm](http://www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm)

For the Build Alternative in this EA, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. For this project, average daily traffic (ADT) volumes and VMT along the affected 3-mile segment of Interstate 17 (south of Dixileta Drive to north of Dove Valley Road) are virtually the same for the No-Build and Build alternatives. The No-Build Alternative assumes that other entities would construct the Dixileta Drive, Lone Mountain Road, and Dove Valley Road traffic interchanges with I-17; traffic volumes and VMT at these locations are similar when comparing the Build and No-Build alternatives. Additional VMT estimated for the project results from traffic movements on the SR 303L system interchange ramps and approaches (see Table 4-4). Based on these data, negligible differences in VMT are anticipated between the Build and No-Build Alternatives by the design of 2030.

Regardless of the alternative chosen, emissions would likely be lower than present levels in the design year because of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

Because of the specific characteristics of the Build Alternative (i.e. a new freeway-to-freeway connection) there may be localized areas where VMT would increase, and other areas where VMT would decrease. Therefore it is possible that localized increases and decreases in MSAT emissions may occur. The localized increases in MSAT emissions would likely be most pronounced at the SR 303L/I-17 system interchange, but current tools and science are not adequate to quantify them. However, even if these increases do occur, they too would be substantially reduced in the future due to implementation of EPA's vehicle and fuel regulations.

In sum, on a regional basis EPA's vehicle and fuel regulations coupled with fleet turnover would, over time, cause substantial reductions that, in almost all cases, would cause region-wide MSAT levels to be significantly lower than today.

<b>Table 4-4</b>		
<b>Travel Characteristics</b>		
<b>Estimated Annual Average Daily Traffic (Vehicles Per Day)</b>		
<b>Design Year 2030</b>		
Location	No-Build	Build
<b>I-17</b> from Dixileta Drive to Dove Valley Road	184,660	183,620
<b>SR 303L</b> from I-17 to 43 <sup>rd</sup> Avenue	NA	104,080
SR 303L, System Traffic Interchange Ramps	NA	52,040
Dixileta Drive Ramps	20,640	20,480
Lone Mountain Road Ramps	22,995	17,400
Dove Valley Road Ramps	15,785	14,540
<b>Estimated Annual Vehicle Miles of Travel (VMT Per day)</b>		
<b>Design Year 2030</b>		
Location	No-Build	Build
<b>I-17</b> from Dixileta Drive to Dove Valley Road	553,980	550,860
<b>SR 303L</b> from I-17 to 43 <sup>rd</sup> Avenue	NA	58,860
SR 303L, System Traffic Interchange Ramps	NA	77,469
Dixileta Drive Ramps	6,587	6,536
Lone Mountain Road Ramps	9,075	6,867
Dove Valley Road Ramps	6,480	5,969

NOTES:

1. No-Build ADTs are taken from Table 4-11 of the Change of Access Report 3/28/06. Derivation of these is explained in this report.
2. No-Build ADTs for ramps are derived in similar fashion as No-Build ADTs taken from Table 4-11, noted above.
3. Build ADT are taken from Figure 3-1 of the Change of Access Report.
4. None of the ADT estimates include connecting arterials, HOV lanes, or frontage roads.
5. Average ADT from Dixileta Drive to Dove Valley Road includes approximately ½ mile south of Dixileta to ½ mile north of Dove Valley, a distance of about 3 miles.
6. Distances were measured from design files prepared for the Design Concept Report.
7. VMTs = ADTs multiplied by roadway segment distance.

Construction activity may generate a temporary increase in MSAT emissions. Project-level assessments that render a decision to pursue construction emission mitigation would benefit from a number of technologies and operational practices that should help lower short-term MSATs. In addition, the SAFETEA-LU (Public Law 109-59, August 10, 2005) has emphasized a host of diesel retrofit technologies in the law's CMAQ provisions - technologies that are designed to lessen a number of MSATs.

Construction mitigation includes strategies that reduce engine activity or reduce emissions per unit of operating time. Operational agreements that reduce or redirect work or shift times to avoid community exposures can have positive benefits when sites are near vulnerable populations. For example, agreements that stress work activity outside normal hours of an adjacent school campus would be operations-oriented mitigation. Also related to construction



emissions, technological adjustments to equipment such as off-road dump trucks and bulldozers could be appropriate strategies. These technological approaches could include particulate matter traps, oxidation catalysts, and other devices that provide an after-treatment of exhaust emissions. The use of clean fuels, such as ultra-low sulfur diesel, also can be a very cost-beneficial strategy.

The EPA has listed a number of approved diesel retrofit technologies; many of these can be deployed as emissions mitigation measures for equipment used in construction. This listing can be found at: [www.epa.gov/otaq/retrofit/retroverifiedlist.htm](http://www.epa.gov/otaq/retrofit/retroverifiedlist.htm).

#### **4.5.3 Mitigation**

Fugitive dust generated from construction activities would be controlled in accordance with the ADOT *Standard Specifications for Road and Bridge Construction*, Section 104.08 (ADOT 2000); special provisions; and local rules or ordinances. According to the ADOT *Standard Specifications for Road and Bridge Construction* (ADOT 2000), Section 104, “Scope of Work,” Subsection 08, “Prevention of Air and Noise Pollution,” “[t]he contractor would control, reduce, remove or prevent air pollution in all its forms, including air contaminants, in the performance of the contractor’s work.” The contractor would comply with all air pollution ordinances, regulations, orders, etc., during construction. All dust-producing surfaces would be watered or otherwise stabilized to reduce short-term impacts associated with an increase in particulate matter attributable to construction activity.

Construction of the project would comply with *Maricopa County Air Quality Rule 310 – Fugitive Dust Sources* and any required air quality permits. By implementing the ADOT specifications and the requirements under MCESD Rule 310, the potential for air quality impacts related to roadway construction activities would be substantially reduced. Air quality would therefore not be adversely affected during the project construction phases.

To minimize emissions from idling and slow moving traffic in the construction zones, traffic control would be in accordance with the most current *Manual on Uniform Traffic Control Devices for Streets and Highways*, published by the FHWA, including any revisions or additions, and/or associated provisions in the project plans, as determined by the ADOT Traffic Design Section during design.

#### **4.5.4 Conclusion**

The No-Build Alternative would produce air emissions due to construction activities related to arterial roads. In addition, according to the traffic report prepared for this project, the No-Build Alternative would result in a congested local arterial road network. A worst-case (maximum) CO modeling analysis determined that the predicted maximum ambient CO concentrations would be

higher under the No-Build Alternative than with the proposed project. Therefore, the proposed project would be expected to improve overall air quality within the region.

The approach for the CO analyses is consistent with the requirements of the federal transportation conformity rule (40 CFR Parts 51 and 93). The design concept and scope of the proposed project are consistent with the design concepts and scopes analyzed by MAG for the RTP. Therefore, pursuant to the transportation conformity rule, the proposed project conforms to the State Implementation Plan for achieving NAAQS. Particulate emissions resulting from construction of the proposed project would be effectively mitigated by implementing ADOT standard specifications on dust generation and by effectively managing traffic through detour areas.

An evaluation of mobile source air toxic emissions shows that VMT on I-17 and at selected traffic interchanges is about the same under the No-Build and Build alternatives. While VMT would increase locally at the L303/I-17 system interchange in the Build Alternative, it is likely to be reduced on a regional basis by consolidating travel from dispersed arterial streets to the freeways.

## **4.6 NOISE**

### **4.6.1 Existing Conditions**

#### **Fundamentals of Traffic Noise**

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, perceived importance of the noise and its appropriateness in the setting, time of day and type of activity during which the noise occurs, and sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and that are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in hertz (Hz), whereas intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels. The minimum change in the sound level of individual events that an average

human ear can detect is about 3 dB. The average person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness; this relation holds true for sounds of any loudness.

Sound from a tuning fork (a pure tone) contains a single frequency; however, most sounds one hears in the environment do not consist of a single frequency but a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all of a sound's frequencies according to a weighting system that reflects the fact that human hearing is less sensitive at low frequencies and extremely high frequencies than at mid-range frequencies. This is called "A" weighting, and the decibel level measured is referred to as the A-weighted decibels (dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the dBA may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor called the  $L_{eq}$  (equivalent sound level) is used. ADOT and the FHWA use the 1-hour  $L_{eq}$  ( $L_{eq}(h)$ ) during the peak-traffic-noise period to assess potential noise impacts and determine necessary abatement measures for roadway noise.

### **Noise Characteristics of Vehicles and Roadways**

Roadway noise is dependent on many factors:

- Vehicle type and speed
- Number of vehicles
- Roadway surface and gradient
- Distance from the roadway to the receiver
- Relative location of a receptor to noise source
- Ground surface characteristics (whether acoustically reflective or absorptive, "pavement" or vegetation")
- Meteorological factors such as wind and temperature gradients
- Shielding due to structures, sound walls, earthen berms, or hills

Generally, if vehicle speed and/or traffic volume increases, so does the noise level. However, heavy trucks typically operate at a more constant noise output than automobiles regardless of speed, because they retain a nearly constant engine speed in revolutions per minute.

The noisiest component from cars is typically the tires and the tire/road interface, while for most trucks much of the noise emanates from the exhaust stack. This affects the noise reduction provided by a barrier because both the height and proximity of the source and receiver with respect to the barrier's location and height are important in determining the effectiveness of the barrier.

Roadway surface and gradient also affect the resultant noise. Surfaces vary from rough and potholed to smooth and seal-coated, and this can lead to an approximate difference of 3 to 4 dBA in generated noise levels among different types of surfaces (Bolt, Beranek, and Newman, Inc. 1973). Primarily, the roadway gradient influences noise levels for heavy truck traffic; the greatest effect is from an uphill grade, which increases noise levels.

### **Existing Noise Environment**

The proposed project is located in an area that is primarily rural or undeveloped and is composed of desert scrub with varying elevations and small watersheds (*arroyos*). The primary noise sources in this area are vehicular traffic (along I-17), small aircraft overflights from the Deer Valley Airport, military jet aircraft overflights, and construction activities. There are no noise-sensitive receptors within 2,600 feet of the proposed project.

Existing noise conditions along I-17 were measured as part of the I-17 Widening Design Concept Study. Ambient noise levels measured between approximately 55 dBA near Carefree Highway (measurement was taken at the Tramonto development) and approximately 59 dBA at Dynamite Boulevard (measurement was taken near the KB Homes development) (ADOT 2003). These measurements occur about one mile from the proposed project location, but provide a general range for the approximately 4 miles between the two points, where the proposed project would interconnect with I-17.

#### **4.6.2 Impacts**

##### **No-Build Alternative**

If the No-Build Alternative is selected, the proposed project would not be built. Future development of the area is expected to continue and arterial roads are expected to be improved and built to support this development. Noise is expected to increase in the general area due to future development.

##### **Proposed Project**

Based on the fact that no noise receptors are present within 2,600 feet of the proposed project, minimal noise impacts are anticipated as a result of the proposed project.

Over the long term, it is anticipated that ambient noise levels would increase as development occurs. Additional receptors may be located in the area of the proposed project after this EA is approved, as development in the area is on-going. In accordance with Highway Traffic Noise Analysis and Abatement Policy and Guidelines issued by FHWA (USDOT, FHWA 1995), federal and state governments are no longer responsible for providing noise abatement for new development that occurs adjacent to a proposed highway project after the “date of public knowledge.” The date of public knowledge is the date that the final environmental document has been approved by FHWA.

#### **4.6.3 Mitigation**

According to ADOT *Standard Specifications for Road and Bridge Construction* (ADOT 2000), Section 104, “Scope of Work,” Subsection 08, “Prevention of Air and Noise Pollution,” “[t]he contractor would comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the contract. Each internal combustion engine used for any purpose on the work or related to the work would be equipped with a muffler of a type recommended by the manufacturer.”

#### **4.6.4 Conclusion**

Because there are no noise receptors are present within 2,600 feet of the proposed project, impacts are not expected to occur as a result of the proposed project.

### **4.7 HAZARDOUS MATERIALS**

#### **4.7.1 Existing Conditions**

A Preliminary Initial Site Assessment was conducted for the proposed project (URS 2004a). In addition, information was gathered and reviewed from several environmental databases through Environmental Data Resources, Inc. (EDR) to evaluate whether activities on or near the study area have the potential to create an environmental concern. EDR reviews databases compiled by federal, state, and local governmental agencies.

It should be noted that this information is reported as it is received from EDR, which, in turn, reports information as it is provided in various government databases. It is not possible to verify the accuracy or completeness of information contained in these databases. However, the use of and reliance on this information is a generally accepted practice in the conduct of environmental due diligence. EPA and ADEQ documents and lists were reviewed

EDR’s databases indicate that no known Hazardous material properties are present in the project study area. EDR did identify the City of Phoenix North Gateway Water Reclamation Facility, a



wastewater treatment facility listed at 29810 North Black Canyon Highway (Figure 4-6), but this facility does not present an environmental concern to the proposed project.

#### **4.7.2 Impacts and Mitigation**

##### **No-Build Alternative**

If the No-Build Alternative is selected, the proposed project would not be built. Future development of the area is expected to continue, and arterial roads are expected to be improved and built to support this development.

Future development in the area has the potential to impact Hazardous material sites if sites are located in the areas to be developed. No observed or suspected concerns or unusual conditions were found within the study area and therefore no impacts would occur under the No-Build Alternative.

##### **Proposed Project**

Based on the information presented in the database review, no observed or suspected concerns or unusual conditions were found and no specific mitigation is required. This assessment would be updated within six months of initiation of construction because the information summarized above is subject to change.

If construction activities include the modification or demolition of any structures (including concrete structures such as culverts, pipes, overpasses, etc.), a Hazardous material survey would be required prior to demolition activities.

If suspected Hazardous material is encountered during construction, work would cease at that location and the ADOT Engineer would arrange for proper assessment, treatment, or disposal of those materials.

In addition, all discarded waste (including but not limited to human waste, trash, debris, oil drums, fuel, ashes, equipment, concrete, and chemicals) generated during construction activities would be removed and/or disposed of according to federal and state regulations.

According to ADOT's *Standard Specifications for Road and Bridge Construction*, (ADOT 2000), Section 107, "Legal Relations and Responsibility to Public," Subsection 07, "Sanitary, Health, and Safety Provisions," should the contractor encounter potential hazardous or contaminated material, the contractor would immediately stop work and remove workers, barricade the area, provide traffic controls and notify the ADOT Engineer. The ADOT Engineer would arrange for proper assessment, treatment, or disposal of those materials. Such locations

would be investigated and proper action implemented prior to the continuation of work in that location.

#### **4.7.3 Conclusion**

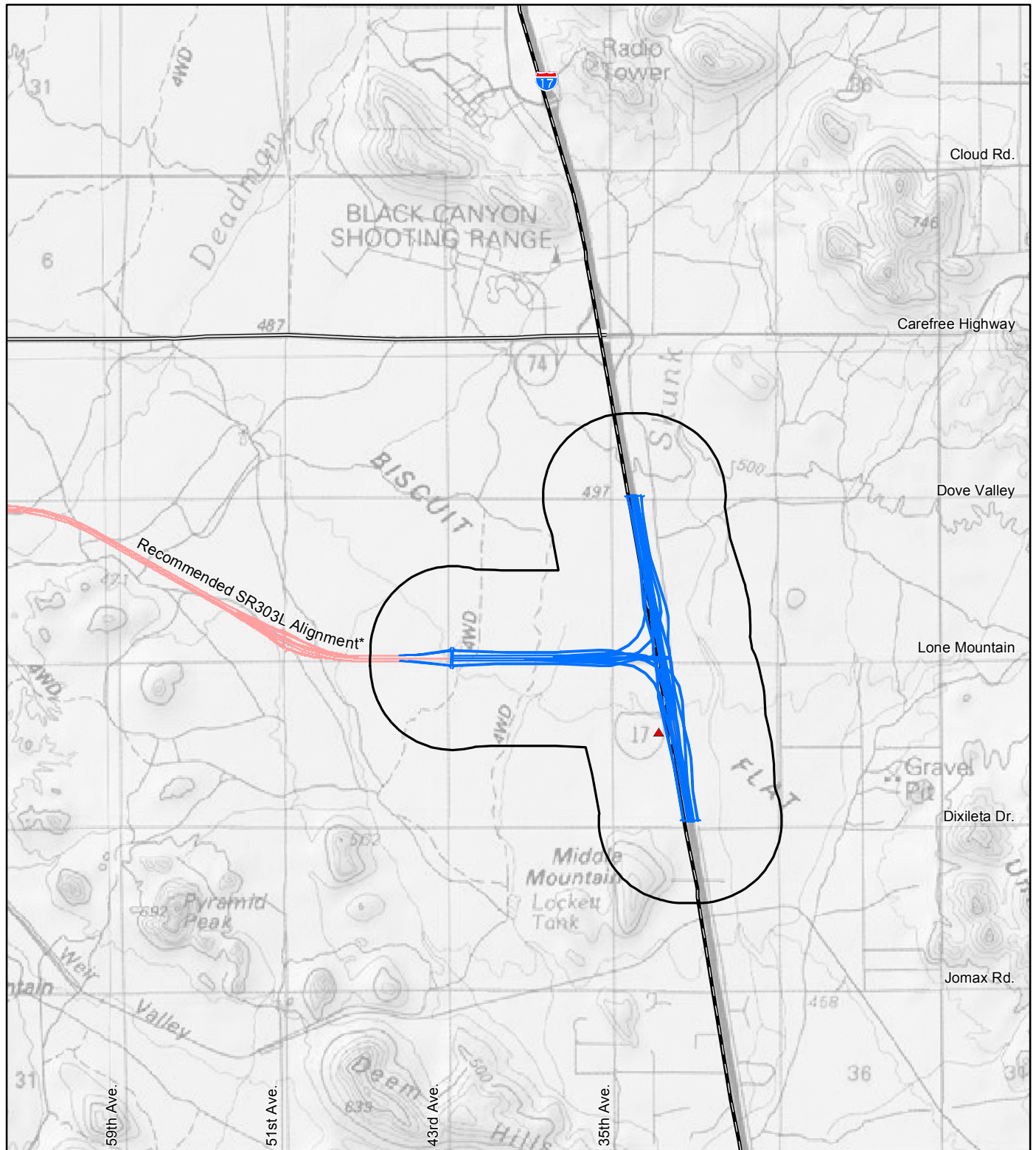
No adverse impacts related to Hazardous material are anticipated as a result of the proposed project. Updated initial site assessments would be obtained during final design if right-of-way is required from, or excavation is anticipated on or adjacent to, any properties identified with potential Hazardous material contamination. During Phase IV of the final design, the ADOT project manager would contact ADOT's Environmental Planning Group Hazardous material coordinator (602-712-7768) to determine the need for additional site assessment. It should also be noted that if additional construction activities include the demolition of any structures (including concrete structures such as culverts, pipes, overpasses, etc.), an asbestos survey is required prior to demolition activities.

### **4.8 CULTURAL RESOURCES**

#### **4.8.1 Existing Conditions**

##### **Description of Cultural Resources**

An intensive pedestrian survey of areas that could be affected by construction of the proposed project identified six archaeological and historical sites (Table 4-5), as well as 76 isolated occurrences of artifacts (Rogge et al. 2004).



## Legend

- ▲ Potential Hazardous Material Concern
- ▭ Study Boundary
- ▭ County Line
- Proposed Project
- Recommended SR303L Alignment\*
- Interstate/Highway
- State Route

\*The recommended alignment is being evaluated in a separate EA.

Source:

-Arizona Land Resource Information System, 1997.

-Map created with TOPO(tm) (c)2002 National Geographic Holdings (www.topo.com).



## Estrella Freeway (SR 303L)

### 43rd Avenue to I-17

Project No. NH-303-B (AJX)

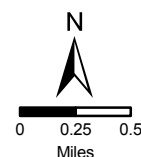
Tracs No. 303L MA 003 H5946 01L

## Potential Hazardous Material Location

Figure 4-6



Federal Highway Administration



**Table 4-5  
Summary of Cultural Resources within  
the Area of Potential Effect**

<b>Site Name/ Number</b>	<b>Affiliation and Age</b>	<b>Site Type</b>	<b>National Register Eligibility</b>	<b>Proposed Treatment</b>
Black Canyon Road (SR 69) AZ T:4:131(ASM), Segments 1, 3, 4, and 18	Euro-American, circa 1860s-1950s	historic roadway with berms, two rock alignments may not be associated	SR 69 eligible under Criterion D, but these segments are not historic character defining elements of the highway and it is recommended they be considered non- contributing components of SR 69.	no further consideration
AZ T:3:344(ASM))	aboriginal, undated	artifact scatter, <200 artifacts, three rock alignments probably not associated with artifacts	Previously determined not eligible	no further consideration
AZ T:4:383(ASM)	Euro-American, mid-twentieth century, aboriginal component, undated	livestock feeding station with wooden feed trough, 27 historical artifacts, 5 pieces of flaked stone	Recommended not eligible	no further consideration
AZ T:4:384(ASM)	Euro-American, circa 1930s	artifact scatter, estimated 83 artifacts	Recommended not eligible	no further consideration
AZ T:4:385(ASM)	Euro-American, circa 1900-1920	artifact scatter, estimated 49 artifacts	Recommended not eligible	no further consideration
AZ T:4:386(ASM)	Euro-American, circa 1900-1950	artifact scatter, estimated 18 artifacts	Recommended not eligible	no further consideration

### **National Register Eligibility**

None of the cultural resources within the project area are evaluated as eligible for the National Register of Historic Places.

### **4.8.2 Impacts**

#### **No-Build Alternative**

If the No-Build Alternative is selected, the proposed project would not be built. Future development of the area is expected to continue and arterial roads would need to be improved and built to support this development. No cultural resources eligible for the National Register of Historic Places were identified in the study area and therefore impacts to cultural resources are not expected with the No-Build Alternative.

## **Proposed Project**

The State Historic Preservation Office has concurred with a determination of “no adverse effect,” as defined by regulations for *Protection of Historic Properties*, [36 CFR Part 800.5(d)(1)], which implements Section 106 of the National Historic Preservation Act.

### **4.8.3 Mitigation**

According to the Arizona Department of Transportation’s *Standard Specifications for Road and Bridge Construction* (ADOT 2000), Section 107, “Legal Relations and Responsibility to Public,” Subsection 05, “Archaeological Features,” “[w]hen previously unidentified archaeological, historical, or paleontological features are encountered or discovered during any activity related to the construction of the project, the contractor would stop work immediately at that location and would take all reasonable steps to secure the preservation of those resources and notify the Engineer.” The Arizona Department of Transportation Engineer would, in turn, notify the Environmental Planning Group Historic Preservation Team (602-712-8636) to evaluate the significance of the resources.

### **4.8.4 Conclusion**

No additional consideration of cultural resources is warranted unless cultural remains or human remains are unexpectedly encountered during project implementation.

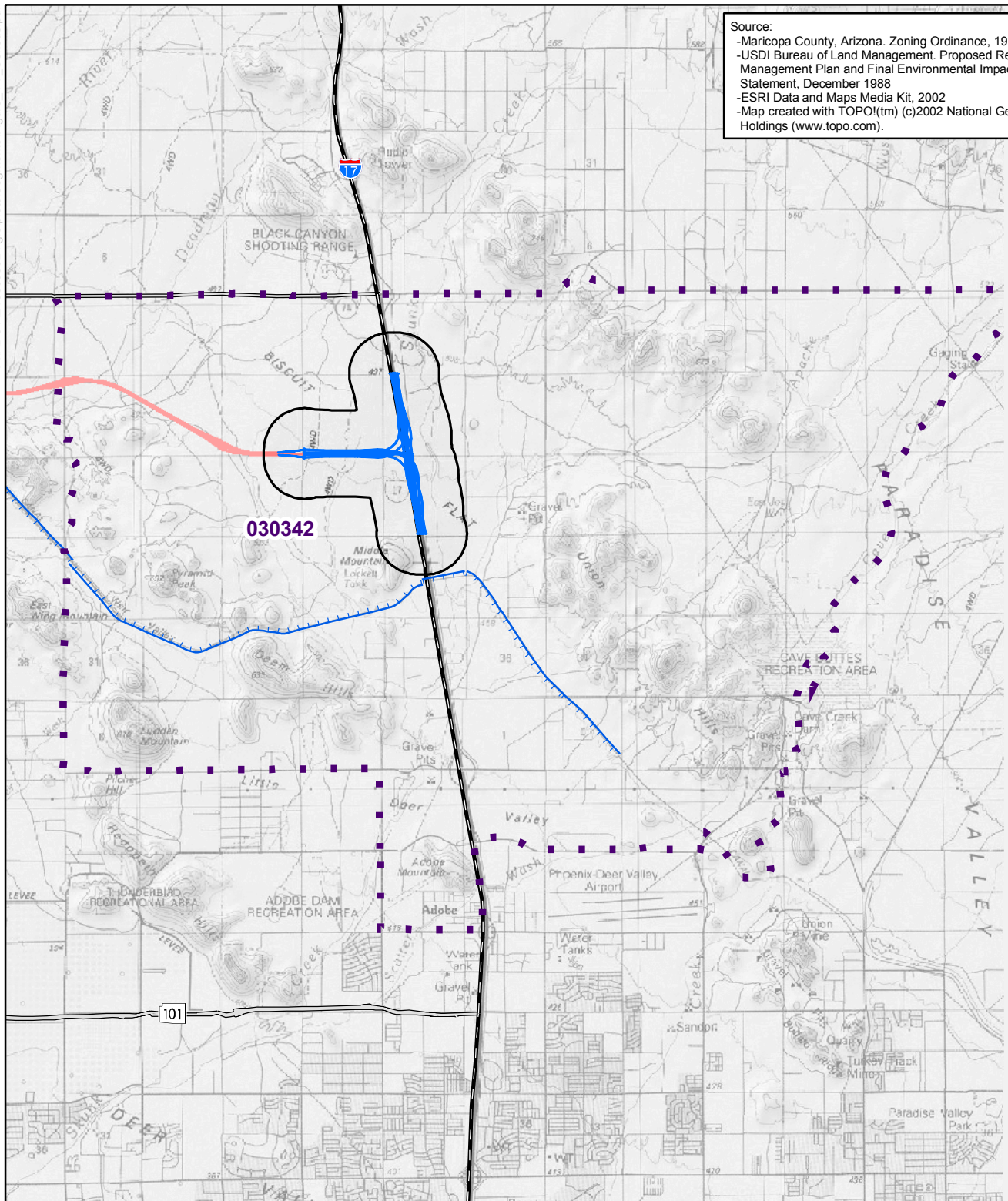
## **4.9 SOCIOECONOMIC RESOURCES**

### **4.9.1 Demographics**

The demographic profile of the study area was compared to those of the City of Peoria, City of Phoenix, and Maricopa County (Table 4-6) using census tract data obtained from the U.S. Bureau of the Census. Census tracts represent small statistical subdivisions of a county. Census tract number 303.42, illustrated in Figure 4-7, includes the project study area and was used as the basis for this comparison. However, because the area described by census tract number 303.42 extends outside the study area, the exact population and demographic characteristics of the study area (the area within one-half-mile of the proposed project’s centerline) may vary from these data. In addition, it should be noted that the nearest existing resident is more than a mile from the proposed project.



Source:  
 -Maricopa County, Arizona. Zoning Ordinance, 1993  
 -USDI Bureau of Land Management. Proposed Resource Management Plan and Final Environmental Impact Statement, December 1988  
 -ESRI Data and Maps Media Kit, 2002  
 -Map created with TOPO(tm) (c)2002 National Geographic Holdings (www.topo.com).



## Legend

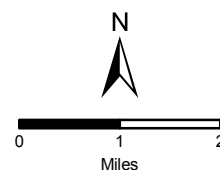
- Study Boundary
- Proposed Project
- Recommended SR303L Alignment\*
- Interstate/Highway
- State Routes
- Roads
- Canals
- 2002 Census Tracts
- Census Tracts with Tract Number



## Estrella Freeway (SR 303L) 43rd Avenue to I-17

Project No. NH-303-B (AJX)  
 Tracts No. 303L MA 003 H5946 01L

## Census Tract Figure 4-7



\*The recommended alignment is being evaluated in a separate EA.

<b>Table 4-6</b> <b>Population Characteristics</b>				
<b>Demographic Characteristic</b>	<b>Census Tract 303.42<sup>1</sup></b>	<b>City of Peoria</b>	<b>City of Phoenix</b>	<b>Maricopa County</b>
<b>Total Population</b>	8,786	108,364	1,321,045	3,072,149
<b>Gender:</b>				
Male	53.8%	48.0%	50.9%	50.0%
Female	46.2%	52.0%	49.1%	50.0%
<b>Race:</b>				
White alone	<b>87.7%</b>	84.9%	71.1%	77.4%
Black or African-American alone	2.6%	2.8%	5.1%	3.7%
American Indian/ Alaska Native alone	1.4%	0.7%	2.0%	1.8%
Asian alone	1.6%	1.9%	2.0%	2.2%
Some Other Race alone <sup>2</sup>	<b>4.4%</b>	7.2%	16.5%	12.0%
Two or More Races alone	2.2%	2.5%	3.3%	2.9%
Hispanic or Latino	<b>14.5%</b>	15.4%	34.1%	24.8%
<b>Age 60 years and Over</b>	<b>6.4%</b>	18.1%	10.9%	15.1%
<b>Disabled</b>	14.5%	18.4%	19.1%	18.0%
<b>Individuals below poverty level<sup>3</sup></b>	7.0%	4.7%	12.4%	9.7%
<b>Median household income</b>	<b>\$55,864</b>	\$52,199	\$41,207	\$45,358

Source: U.S. Bureau of the Census 2000. Bolded information in the table indicates characteristics that are noticeably different than populations in Maricopa County.

<sup>1</sup>Nearest population in the census tract is located approximately one mile or more from the preferred alternative.

<sup>2</sup>Includes Native Hawaiian and Other Pacific Islander.

<sup>3</sup>Among civilian non-institutionalized persons 16 years of age and over.

Percentages may not total 100 due to rounding.

The demographic data evaluated suggest several patterns. For example, the study area has a higher percentage of white residents and lower percentages of non-whites and persons classified as Hispanic or Latino than Maricopa County. In addition, a lower percentage of residents living below the poverty level exists within the study area compared to the City of Phoenix and Maricopa County, and the median income exceeds that of all the comparison populations. In general, the study area's population is less likely to be part of a minority group, and is younger and more affluent than the average Maricopa County population.

MAG forecasts a population of 6.3 million in Maricopa County in 2030. MAG also predicts that the northwestern region of the metropolitan area is expected to grow to 1.86 million, or 31 percent of the projected regional total, by 2030.

#### **4.9.2 Environmental Justice**

Title VI of the Civil Rights Act of 1964 and related statutes assure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, or disability. Executive Order 12898 on Environmental Justice directs that programs, policies, and activities not have disproportionately high and adverse human health and environmental effects on minority and low-income populations.

For purposes of this analysis, the following populations were evaluated:

- Minority populations — persons of Hispanic or Latino origin of any race; Blacks; American Indian/Alaska Natives; and Asians or Pacific Islanders.
- Elderly populations — persons of age 60 or greater.
- Disabled populations — persons with a physical or mental impairment that substantially limits one or more of the major life activities.
- Low-income populations — composed of persons living below the poverty level. The U.S. Census Bureau uses a set of income thresholds that vary by family size and composition to determine who is poor.

Maricopa County population data provides a basis of comparison to determine whether certain groups occur disproportionately within the overall study area population. Table 4-5 indicates that the proportion of minority populations within the study area is less than that in the comparison population of Maricopa County. The table also indicates that the percentage of individuals below the poverty level is lower in the study area than in Maricopa County. Therefore, the project area is not characterized by disproportionate occurrences of environmental justice populations.

#### **4.9.3 Impacts**

##### **No-Build Alternative**

The planned commercial and residential development of the study area may be altered if the No-Build Alternative is selected. Thus, the No-Build Alternative would impact the area's economic potential by reducing access to planned commercial areas and residential neighborhoods, and failing to support adopted development plans within the study area. These impacts would occur on a regional basis, and therefore would not be expected to be borne disproportionately by any particular racial, age, or income group.

Under the No-Build Alternative, developers and/or cities would be responsible for future construction of arterial streets linking the interchanges. As a result, costs for implementing the transportation network would be shifted to a more localized population.

## **Proposed Project**

### Environmental Justice

Concentrations of residents (including minority and low-income groups) do not occur in the study area. The proposed project is not anticipated to have adverse effects on human health and the environment for the population generally, and consequently would not result in disproportionately high and adverse impacts on minority and low-income populations. The proposed project would allow access to planned commercial and residential areas, which would support the area's planned and adopted development plans and enhance the area's economic potential, thus providing a beneficial impact.

### Neighborhood Continuity

The study area consists primarily of undeveloped land; therefore, neither the No-Build Alternative nor the proposed project would divide any established residential areas. The proposed project would provide necessary regional access to future shopping, educational, recreational, and other community services. The proposed project would allow the development of neighborhoods consistent with adopted plans for the study area.

### Emergency Services – Police, Fire, Ambulance, Hospital

Development within the project vicinity is served by the following emergency response departments:

- City of Phoenix Fire Department (5230 West Happy Valley Road)
- City of Phoenix Police Department (6255 West Union Hills Drive)
- Rural Metro Fire Department (intersection of Indian School Road and Granite Reef)
- Maricopa County Sheriff Department (intersection of Dysart Road and Bell Road)
- Department of Public Safety (intersection of 111<sup>th</sup> Avenue and Peoria Avenue)

Two hospitals are within approximately two miles of the proposed project. Arrowhead Community Hospital is southeast of the study area near the intersection of 67<sup>th</sup> Avenue and Union Hills Drive, and John C. Lincoln Hospital is near the I-17 and SR 101 interchange southwest of the study area. The proposed project would provide additional transportation infrastructure and connectivity in a developing area; therefore, access to emergency services would be improved with the proposed project.

Neither the No-Build Alternative nor the proposed project would directly impact access to existing police, fire, ambulatory, or hospital services. It is expected that the proposed project would have a positive impact on emergency services within the region by providing an enhanced freeway system that would provide improved access to the project vicinity and also the northwest and southwest portions of the Phoenix metropolitan area.

### Social Services, Schools, and Recreation

The study area includes the Peoria Unified School District #11 and Deer Valley Unified School District #97. There are several educational facilities located throughout the overall project region; however, the closest school is more than three miles distant from the proposed project. More specifically, the Anthem Elementary School is located approximately one mile east of I-17 and about one mile north of Desert Hills Drive. The proposed project would not impact existing educational facilities in the area because the project would not affect existing access to such facilities.

There are several designated recreational areas within the overall project region, including the Lake Pleasant Regional Park, Thunderbird Park, and Adobe Dam Recreation Area; none of these areas would be impacted by the proposed project. Finally, the Ben Avery Shooting Range is located immediately north of SR 74 and west of I-17; access to this facility is provided from SR 74. Implementation of the proposed project would maintain access to the Ben Avery Shooting Range property.

### Relocations/Displacements

No residential or commercial displacements or relocations would be required for construction of the proposed project.

### Access

During construction of the proposed project, traffic on existing roads through the area and access to adjacent properties would be maintained in accordance with ADOT traffic control management procedures for roadway construction and maintenance. A detour route would be constructed as described in the Section 4.9.4 – Mitigation. However, because no commercial or residential development occurs within the study area, it is expected that disruptions associated with construction would be minimal. Over the long term, construction of the proposed project would benefit all segments of the traveling public in the study area and the overall region by improving access and mobility and reducing congestion on the arterial network.



## Business Disruption

Due to the absence of commercial and residential development within the project area, disruptions associated with construction would be minimal. The reconstruction and widening project for I-17 that is planned and programmed would have to be modified to incorporate the interchange with SR 303L and Lone Mountain Road.

To minimize temporary impacts associated with construction of the proposed project, the ADOT District Construction office would provide notices of construction to any nearby residents and business owners at least two weeks prior to construction. As a result of the temporary detours during project construction, a decrease in traffic speeds on I-17 through the proposed area of construction would occur.

### **4.9.4 Mitigation**

An I-17 detour route required for the construction of the proposed project would be constructed within the proposed project right-of-way and would accommodate the existing number of lanes on I-17 at a design speed of at least 55 mph. Traffic control would be implemented in accordance with Part VI of the *Manual on Uniform Traffic Control Devices for Streets and Highways*, published by FHWA (1993), *Traffic Control Supplement* (1996), and/or associated provisions in the project plans, as determined by the ADOT Traffic Design Section during design.

### **4.9.5 Conclusion**

No adverse socioeconomic effects would occur as a result of the proposed project, due to (1) the use of State Trust land for new right-of-way and consequent avoidance of residential or commercial displacement or relocation, (2) the lack of adverse effects to human health and the environment associated with the proposed project, and (3) the lack of impacts associated with residential or business access throughout construction. The implementation of the proposed project would benefit the current and projected population by improving circulation patterns and access in the area, as well as by accommodating future traffic demand.



## **4.10 SECTION 4(F) OF THE TRANSPORTATION ACT**

### **4.10.1 Existing Conditions**

Section 4(f) of the Department of Transportation Act of 1966 states that the FHWA "... may approve a transportation program or project...requiring publicly-owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if ... there is no prudent or feasible alternative to using that land; and ... the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use." (49 U.S.C. 303[c])

A "use" of a Section 4(f) resource, as defined in 23 CFR Part 771.135(p), occurs (1) when land is permanently incorporated into a transportation facility, (2) when there is a temporary occupancy of land that is adverse in terms of the statute's preservationist purpose, or (3) when there is a constructive use of land. A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from resources, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. For example, a constructive use can occur when:

- a) the projected noise level increase, attributable to the project, substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource protected by Section 4(f);
- b) the proximity of the proposed project substantially impairs aesthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. An example of such an effect would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or substantially detracts from the setting of a park or historic site which derives its value in substantial part due to its setting; and/or
- c) the project results in a restriction on access, which substantially diminishes the utility of a significant publicly owned park, recreation area, or historic site.

Two known, existing recreation areas subject to the requirements of Section 4(f) have been identified in the general project area. These include (1) the Ben Avery Shooting Range and Recreation Area, located north of SR 74; and (2) the Black Canyon Trails Cooperative Recreation Management Area, located one mile north of the Desert Hills Drive alignment and

approximately 2 miles west of I-17. The Black Canyon Trail extends as far south as SR 74 and parallels the west side of the shooting range.

#### **4.10.2 Impacts and Mitigation**

The Ben Avery Shooting Range and Recreation Area and the southernmost point of the Black Canyon Trail are located over one mile to the north of the proposed project. No right-of-way would be required from these resources as part of the proposed project. No constructive use of this resource would occur as a result of the proposed project because (1) visual resources, noise levels, and other features associated with these resources would not be adversely affected due to the distance from the proposed project; and (2) the proposed project would not restrict access to either resource.

The proposed project would not impact any publicly owned wildlife or waterfowl refuge, or any other such designated wildlife management area. No designated Recreation and Public Purpose Lands have been identified within the vicinity of the proposed project based on a review of the U.S. Department of the Interior, Bureau of Land Management's *Proposed Phoenix Resource Management Plan and Final Environmental Impact Statement* (1988).

#### **4.10.3 Conclusion**

The proposed project would not impact any known 4(f) resources.

### **4.11 UTILITIES**

#### **4.11.1 Existing Conditions**

Most of the existing utilities—including mainly fiber optics, telephone cable, and gas and power lines—are in the vicinity of the proposed I-17 interchange. Utility owners in the area of the proposed project are Arizona Public Service Company (APS), Southwest Gas, AT&T, Cox Communications, and Qwest. The CAP Canal also traverses the area.

As this area continues to be developed, more utilities would be installed in the area. Future utilities would include fiber optic, water, sewer, gas, and power lines. Main trunk lines as well as distribution systems for each of these facilities would be necessary to service the developing communities.

APS has a planned 230 kV transmission line that would traverse along the north side of the Dove Valley Road section line and cross the proposed project south of Carefree Highway and again east of 43<sup>rd</sup> Avenue.

#### **4.11.2 Impacts and Mitigation**

The existing utilities in the proposed project area are parallel to I-17. The EA for the I-17 widening prepared by ADOT for FHWA and dated March 2004 addresses the relocation of these utilities. The proposed project in this DEA would require that the utilities be located farther away from I-17. The utilities would be relocated only once and that would be to meet the needs of the proposed project.

It is expected that ADOT would construct the I-17 widening prior to construction of the SR 303L interchanges or the Dove Valley interchange. The right-of-way and utility corridor requirements would be obtained in conjunction with the I-17 widening project based on the proposed project.

Coordination with APS would be required to ensure that the future 230 kV line that is planned to cross between 43<sup>rd</sup> Avenue and I-17 would have adequate vertical clearance and that the poles would be located outside the proposed right-of-way for SR 303L.

Coordination with developers regarding future utilities development would be necessary to avoid conflicts. ADOT's Utility and Railroad Engineering Section would coordinate utility involvement during the project design phase.

#### **4.11.3 Conclusion**

Utility companies have participated in the study and design process for the proposed project, and their continued involvement would ensure that the proposed project would not adversely affect existing or planned utilities in the project area.

### **4.12 MATERIAL SOURCES AND WASTE MATERIALS**

The project area includes a large number of material sources that could be used for facility construction. The proposed project is not anticipated to generate any waste material and would not require or designate a waste disposal site. It would be the responsibility of the construction contractor to identify any needed material sources and to provide the environmental documentation regarding use of these sites, as specified in Section 104.12 of ADOT's *Standard Specifications for Road and Bridge Construction* (ADOT 2000).

According to ADOT's *Standard Specifications for Road and Bridge Construction* (ADOT 2000), Section 1001, "Material Sources," Subsection 2, "General," any material sources required for this project outside the project area would be examined for environmental effects by the contractor prior to use, through a separate environmental analysis.

According to ADOT's *Standard Specifications for Road and Bridge Construction* (ADOT 2000), Section 107, "Legal Relations and Responsibility to Public," Subsection 11, "Protection and Restoration of Property and Landscape," "[m]aterials removed during construction operations such as trees, stumps, building materials, irrigation and drainage structures, broken concrete, and other similar materials would not be dumped on either private or public property unless the contractor has obtained written permission from the owner or public agency with jurisdiction over the land. Written permission would not be required, however, when materials are disposed of at an operating, public dumping ground." The contractor would dispose of excess waste material and construction debris at a municipal landfill approved under Title D of the Resource Conservation and Recovery Act, construction debris landfill approved under Article 3 of the Arizona Revised Statutes 49-241 (Aquifer Protection Permit) administered by the ADEQ, an inert landfill, or at another approved site.

#### **4.13 CONSTRUCTION WATER SOURCE**

The contractor would be responsible for identifying which water source(s) would be used for construction activities. If an environmental clearance for construction water is needed, it would be addressed in a separate environmental document.

#### **4.14 SECONDARY IMPACTS**

Secondary impacts are defined broadly in the Council on Environmental Quality regulations as "those impacts that are caused by an action and occur later in time, or are farther removed in distance but are still reasonably foreseeable after the action has been completed" (40 CFR Part 1508.8).

The construction of the proposed project would result in increased traffic volumes on SR 303L, and would alleviate congestion on I-17, particularly on weekends. Increased traffic may affect noise and air quality levels. However, air quality analyses indicate that the proposed project would remain in conformity with the State Implementation Plan. Changes in noise levels are expected to comprise a minor incremental effect in the project area. In addition, these improvements would accommodate continuing and planned development in the I-17 corridor and the northwestern portion of the Phoenix metropolitan area. Traffic would be generated by the anticipated residential, commercial, industrial, and municipal uses.

#### **4.15 CUMULATIVE IMPACTS**

Cumulative impacts are defined in 40 CFR Part 1508.7 as "the incremental impact(s) of the action when added to other past, present, and reasonably foreseeable future actions."

The key factor in evaluating cumulative effects for this project is the extensive projected growth and development of the project area. The Cities of Peoria and Phoenix are planning for high rates of residential and commercial development in the project area within 20 years.

Table 4-7, Cumulative Effects, provides a summary by key resource of the potential cumulative effects of past, present, and future actions in combination with the proposed project. To evaluate cumulative effects, the proposed project was considered together with the recommended extension of SR 303L from Happy Valley Road to 43<sup>rd</sup> Avenue, which would complete this section of the proposed regional freeway system. Overall, the proposed project is expected to have a minor incremental effect when added to the anticipated growth and development in the area, which would contribute to major changes to most resources. Projected development establishes the purpose and need for the proposed project, and the proposed project would provide positive impacts associated with the accommodation of projected traffic.

<p><b>Table 4-7</b> <b>Cumulative Effects</b></p>					
<b>Resource</b>	<b>Past Actions</b>	<b>Present Actions</b>	<b>Proposed Action</b>	<b>Future Action</b>	<b>Cumulative Effect</b>
Cultural Resources	Development and road construction to date may have disturbed some cultural sites.	Ongoing development would require cultural survey that would identify additional sites, and sites may be disturbed due to development activity.	No adverse effect is expected as a result of the proposed project. ADOT would be contacted to identify necessary actions if previously unidentified cultural resources are encountered during project implementation.	Projected development would result in additional cultural survey, identification of sites, and disturbance of sites.	Extensive development of the project area would result in the survey and/or disturbance of cultural sites. It is difficult to quantify the overall effects due to uncertainty as to the resources that may be discovered throughout the area.
Biological Resources	The construction of roads and utilities has fragmented the area, intersecting habitat and potential wildlife corridors.	Ongoing development would result in the loss of vegetation and habitat.	Construction of the proposed project would result in some loss of vegetation but overall minimal impacts to vegetation and habitat. Impacts to protected native plants would be mitigated in accordance with the Native Plant Law.	Projected development would result in major loss of existing vegetation and habitat, and the displacement of wildlife.	The conversion of the project area into a more urban, developed environment would trigger the loss or degradation of vegetation and biodiversity. The proposed project would contribute a minor incremental effect on biological resources.
Air Quality	Unimproved roads and traffic on I-17 and local roads contribute dust and emissions.	Ongoing development may accelerate emissions from traffic.	Construction of the proposed project would result in minimal, temporary impacts during construction, and overall the project would be in conformity with the State Implementation Plan.	Projected development would increase traffic and associated emissions, road construction, and introduce new sources that likely would degrade air quality.	Air quality would continue to be regulated in accordance with the State Implementation Plan. The proposed project is in compliance with the conformity rule.
Noise	Sources of noise include I-17, other arterial streets, overflights, and construction activities.	Ongoing development increases noise sources	Anticipated changes to noise levels are projected to be within the Noise Abatement Criteria and to not substantially exceed existing noise levels.	Projected development would have increasingly additive effects on noise.	Ambient noise levels would increase as development occurs and I-17 is widened. This would have the effect of minimizing the overall effect of the noise contributed by the proposed project. New receptors likely would be added in the vicinity of the proposed project, but specific locations and the



Table 4-7 Cumulative Effects					
Resource	Past Actions	Present Actions	Proposed Action	Future Action	Cumulative Effect
Land Use and Visual Resources	Some road and other development have occurred.	Ongoing development is occurring and proposed.	Construction of the proposed project would not have adverse impacts on land use or visual resources, due to low scenic quality and expected future development.	Projected development would result in major changes to the visual setting and land use as the area urbanizes.	associated levels of sensitivity to noise cannot be identified with certainty at this time.  Extensive development in the area would result in major changes to land use and the visual setting as the area urbanizes. The proposed project would probably have a synergistic effect with developing land uses, because it would increase access to the area; however, it would be needed to accommodate the projected traffic and the freeway is not considered a cause of projected development.
Water Resources	Road construction and other development (including dam construction and water impoundment) have resulted in impacts to jurisdictional waters and floodplains.	Ongoing development is expected to affect water resources and increase runoff due to impervious surfaces.	The proposed project is not anticipated to adversely affect impacts or drainage. Six ephemeral washes would be crossed by the proposed project. Permit requirements, potential impacts, and mitigation would be identified in consultation with the U.S. Army Corps of Engineers.	Projected development would result in major changes to runoff, and would impact floodplains and jurisdictional waters.	Extensive development of the project area would result in the changes to water quality and natural floodplains. The proposed project would have a minimal incremental effect on water resources.